U.S. Department
of Transportation

**Federal Railroad
Administration**

1997 Railroad Employee Fatalities:

A Comprehensive Study

Office of Safety
Washington, DC 20590

July 2001

Memorandum

U.S. Department
of Transportation

**Federal Railroad
Administration**

Date: June 18, 2001

Subject: **1997 Railroad Employee Fatalities: A Comprehensive Study**

From: George A. Gavalla
Associate Administrator for Safety

To: Distribution

On behalf of the Office of Safety, I am pleased to distribute this report, entitled "1997 Railroad Employee Fatalities: A Comprehensive Study," designed to promote and enhance awareness of many unsafe behaviors and conditions that typically contribute to railroad employee fatalities. By furthering our understanding of the causes of railroad employee fatalities, this report is intended to assist railroad industry stakeholders in their efforts to prevent similar tragedies.

In addition to the individual narrative reports (provided in the past), this document contains the following ***new*** materials:

- Yard and accident scene diagrams which accompany 28 narrative reports for calendar year 1997;
- Narrative matrix entitled "Analysis of 1997 Employee Fatalities," which highlights important elements of each fatality, particularly the possible contributing factors. This format allows the reader to walk through and analyze each fatality scenario, identifying ways the fatalities could have been prevented;
- Findings which help to identify ***who*** the majority of fatally injured employees were (i.e. craft, job position, age group, years of service); ***when*** they were fatally injured (i.e. time of year, time of day); ***where*** the incidents occurred (i.e. region, type of railroad); and most importantly, ***why*** they occurred in terms of possible contributing factors; and
- Bar and pie charts which illustrate the above findings.

This document will serve as a model for future reports. A comprehensive analysis of 1998 railroad employee fatalities is in progress.

TABLE OF CONTENTS

APPENDICES CONTINUED

BAR & PIE CHARTS CONTINUED

OVERVIEW OF 1997 RAILROAD EMPLOYEE FATALITIES

EXECUTIVE SUMMARY

This document, entitled "1997 Railroad Employee Fatalities: A Comprehensive Study," was designed to promote and enhance awareness of many unsafe behaviors and conditions that typically contribute to railroad employee fatalities. By furthering our understanding of the causes of railroad employee fatalities, this report is intended to assist railroad industry stakeholders in their efforts to prevent similar tragedies.

In addition to the individual narrative reports (provided in the past), this document contains the following ***new*** materials:

- Yard and accident scene diagrams which accompany 28 narrative reports for calendar year 1997 ***(FE-1 through FE-45)***;
- Narrative matrix entitled "Analysis of 1997 Employee Fatalities," ***(Appendix A)*** which highlights important elements of each fatality, particularly the possible contributing factors (PCFs). This format allows the reader to walk through and analyze each fatality scenario, identifying ways the fatalities could have been prevented;
- Findings ***(see below through Page 4)*** which help to identify ***who*** the majority of fatally injured employees were (i.e. craft, job position, age group, years of service); ***when*** they were fatally injured (i.e. time of year, time of day); ***where*** the incidents occurred (i.e. region, type of railroad); and most importantly, ***why*** they occurred in terms of possible contributing factors; and
- Bar and pie charts ***(Appendices B through J)*** which illustrate the above findings.

COMPLEXITY OF FATALITIES

Fatalities usually resulted from a chain of events or the errors of more than one individual, as revealed by the PCFs for each fatality. Complexity of fatalities ranged from straight forward with only one PCF to very complex with as many as nine identified PCFs. Nearly 36 percent of the fatalities involved two PCFs, while 25 percent involved only one PCF. ***The remaining nearly 40 percent involved three or more PCFs.***

As an example of a very complex fatality, FE-03-97 involved the following PCFs:

- The fatally injured Car Inspector wore inappropriately, dark clothing at night;
- The Car Inspector experienced fatigue as a result of working his entire shift in overtime status;
- The Locomotive Engineer of the approaching train failed to sound the bell and illuminate the locomotive's headlights per the railroad's operating rule;
- The noise of nearby locomotives masked the sound of the approaching train;

- The Conductor's view was obstructed by the long hood end of the locomotive he was riding;
- The fatally injured Car Inspector had fouled the track;
- A pole-mounted light was diminished to total darkness by two adjacent locomotive consists approaching at the same time; and
- Yardmasters in the towers failed to notify all affected parties of yard movements as they usually did.

FINDINGS

WHO were most of the fatally injured employees?

- Over 80 percent of all 1997 employee fatalities were Transportation & Engine (T&E) or Maintenance-of-Way (MOW) employees. Half of all fatalities were T&E employees. ***(See Appendix B, pie chart entitled "1997 Railroad Employee Fatalities by Craft.")***

- Nearly one third of all fatally injured employees were Conductors, as numerous as all fatally injured MOW employees combined. ***(See Appendix C, stacked bar chart entitled "1997 Railroad Employee Fatalities by Craft and Position.")***

- Most fatally injured employees were very experienced. Over half had 21-35 years of experience, followed by nearly 18 percent each with 0-5 years and 11-20 years of experience. Half were 46-55 years old, while over 21 percent were 36-45 years old. Just under 11 percent were 18-35 years old. ***(See Appendix D, a stacked bar and cluster bar chart entitled, respectively, "1997 Railroad Employee Fatalities: Years of Service by Craft," and "1997...Fatalities: Age Ranges by Craft.")***

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

- Nearly 40 percent of all fatally injured employees were involved in switching activities, followed by nearly 18 percent who were en route from home to work or class and vice versa. The remaining employees (one or two each) were fatally injured while applying an EOT device, enforcing trespassing laws, installing inter-track fencing, applying blue flag protection, cleaning and salting switches, maintaining track, aligning track, installing signal line boots and hose, installing catenary poles, performing a crew change, or inspecting cars. ***(See Appendix E, stacked bar chart entitled "1997 Railroad Employee Fatalities By Craft and Activity.")***

WHERE did most of the railroad employee fatalities occur?

- Nearly 40 percent of all 1997 employee fatalities occurred in Regions 1 and 4, with none in Region 5. ***(See Appendix F, bar chart entitled "1997 Railroad Employee Fatalities by FRA Region.")***

- Over 64 percent of all employee fatalities occurred on Class I freight railroads, nearly 22 percent on Class II and III freight railroads, and the remaining over 14 percent on commuter and passenger railroads. These railroad categories employed over 71 percent, slightly over 9 percent, and nearly 20 percent of the nation's total railroad employees, respectively. ***(Also see Appendix F, bar chart entitled "1997 Railroad Employee Fatalities by Type of Railroad.")***

WHEN did most of the fatalities occur?

- Nearly half of all fatalities occurred in the winter and over 33 percent occurred in the summer. ***(See Appendix G, pie chart entitled "1997 Railroad Employee Fatalities by Season of Year.")***

- Data of the U.S. Naval Observatory, Astronomical Applications Department, provided the precise times for sunrise and sunset for the specific dates of the fatalities. To distinguish fatalities which occurred during daylight from those which occurred during darkness, this analysis employs the definitions of "day" as at sunrise through sunset, and "night" as immediately after sunset until sunrise. Fatalities were split almost 60-40, night to day, respectively. ***(Also see Appendix G, pie chart entitled "1997 Railroad Employee Fatalities by Time of Day.")***

WHY did most of the fatalities occur?

- The majority (over 65 percent) of all PCFs in the 28 fatalities were Train Operation & Human Factors, followed by nearly 27 percent which were Miscellaneous Contributing Factors. The latter category included highway collisions, inexperience, environmental conditions, highway-rail crossing accidents, inadequate training, object(s) on tracks, excessive noise, and driving under the influence (highway).

  Slightly over 5 percent of all PCFs concerned Track, Roadbed & Structures, specifically irregular cross level of track, insufficient ballast section, and problems with engineering design or construction. Nearly 3 percent involved Mechanical & Electrical Failures, specifically defective steps on the outside of a rail car, and a defective coupler drawhead. ***(See Appendix H, pie chart entitled "Major Possible Contributing Factor Categories Involved in 1997 Railroad Employee Fatalities.")***

- Of all the Train Operation & Human Factors, ***two specific categories predominated:*** Flagging, Fixed, Hand & Radio Signals (nearly 33 percent), and Miscellaneous Human Factors, Track (also nearly 33 percent).

  The "Flagging, Fixed, Hand & Radio Signals" category included the absence of a fixed signal (blue signal), improper hand signal, improper radio communication, failure to give or receive radio communication, inappropriately using or failing to use the train's headlights, and inappropriately using or failing to use the train's horn.

The "Miscellaneous Human Factors, Track" category included inadequate fall protection, fouling the track, intercommunication problems affecting safety for workers on the tracks, non-compliance with on-track-safety rules, non-compliance with Roadway Protection Standards, track repair error, and errors by a Crane Operator and Flagman. ***(See Appendix I, bar chart entitled "Train Operation & Human Factor Categories Involved in 1997 Railroad Employee Fatalities.")***

- Three fourths of all Miscellaneous Contributing Factors involved inexperience/lack of training (30 percent), highway collisions, including driving under the influence (25 percent), or environmental conditions (20 percent).

OTHER SAFETY OBSERVATIONS

In four of the 28 fatalities (14 percent), major errors occurred in either notification of emergency service providers or post-accident toxicological testing procedures. Although these errors did not contribute to the relevant fatalities, they indicate a lapse in the implementation of accident response procedures and they could have prevented officials from obtaining the information necessary to understand how the fatalities occurred:

- In FE-19-97, the county emergency medical service did not receive a call until an hour after the fatality had been discovered. This delay occurred because the Train Dispatchers had difficulty identifying the appropriate emergency service provider for their jurisdiction. The railroad's own police department, which could have facilitated this process, received delayed notification.

- In FE-22-97, the Contractors left the work site without locating the missing Flagman who had been working with their gang. The Conductor of a later through-train reported discovering the Flagman's body 1½ hours after the Contractors had left the site.

- In FE-25-97, post-accident toxicological test results for the deceased were negative. However, FRA cited the carrier for violations regarding the post-accident toxicological testing process (49 CFR Part 219, Part C). The proper form was not completed; samples were not collected promptly; and the carrier did not make the kit available immediately.

- In FE-27-97, blood specimens harvested from the deceased under FRA authority were mailed to lab personnel, who found the vials broken upon arrival and canceled testing. Fortunately, the County Coroner's office conducted tests under its own authority and released the results which were negative.

INDIVIDUAL EMPLOYEE FATALITY REPORTS

(FE-01 THROUGH FE-45)

REPORT: FE-01-97

RAILROAD: Soo Line Railroad (SOO)

LOCATION: Milwaukee, Wisconsin

DATE, TIME: Jan. 8, 1997, 11:25 a.m., CST

PROBABLE CAUSE: Vapors from an oxygen/acetylene gas tank set in an enclosed area were ignited by flying sparks from a rail saw which caused an explosion within the compartment. This resulted in debris striking the nearby employee.

FATALLY INJURED EMPLOYEE:

Craft..... Maintenance of Way

Activity..... Repair of track damaged by derailment

Occupation..... Assistant Foreman

Age..... 52 years

Length of Service..... 32 years

Last Rules Training..... March 28, 1996

Last Safety Training..... March 28, 1996

Last Physical Examination.... Oct. 20, 1995

Circumstances Prior to the Accident

On Jan. 8, 1997 at 7:00 a.m., the Glendale Yard Section Gang (Gang A), comprising a Foreman, an Assistant Foreman, and a Laborer, reported for duty at Glendale Yard, Milwaukee, Wisconsin. The assignment for the day was to repair Yard Track No. 2, which had been damaged by a derailment that occurred on Jan. 6, 1997.

Gang A secured the tracks that they would occupy and set the F-800 hi-rail truck on the north yard lead heading north. Gang A backed down Track No. 3 and began work on Track No. 2. They removed 600 feet of rail that had been dislodged during the derailment. The east rail of this section of Track No. 2 was removed and laid in the middle of Track No. 2. As Gang A completed this task, Gang B, consisting of a Foreman and three Trackmen, arrived at the south end of the yard. The Gang B truck was on Track No. 3. After the two Foremen discussed the

job, Gang B began pulling spikes and cleaning the plates to relay the rail. Gang A began doing the same after the rail was removed.

The Gang A Crew worked south with their hydraulic spike puller toward Gang B. The plate cleaning was completed about 10:45 a.m. The two gangs then laid about six rail lengths of rail into the plates starting from the south end of the damaged track. The Assistant Foreman of Gang A used the cutting torch to cut track bolts from two rail joints and let a Gang A Laborer cut one of the bolts. The Laborer asked to cut some bolts for the experience. The Gang B Foreman took the torch and was cutting bent bolts out of the west rail. He then gave the Laborer a chance to cut some additional bolts.

The Laborer cut one bolt before the torch flame was extinguished. The Laborer tried unsuccessfully to reignite the torch and, after two attempts, was told by the Gang B Foreman to put the torch away.

The Laborer said he thought he heard the Gang A Assistant Foreman say "The tanks are off." The Laborer asked the Gang B Foreman to check the torch to assure that the torch valves were properly turned off, which the Gang B Foreman did. The Laborer said he did not check the tanks to see if they had been shut off. The Laborer did say he purged the gas lines. The Laborer put the torch and hoses away and shut the oxygen/acetylene compartment (gas compartment) door. The truck was moved about 100 feet north to a rail joint from which bars had been cut.

The Gang A Assistant Foreman was going to saw off about three inches of rail to eliminate a broken rail end. The Gang B Foreman told the Assistant Foreman he would saw this rail end, as the Assistant Foreman had sawed the previous ones. The saw, hydraulic-powered from the F-800 truck, was operated from the same side of the truck as the gas compartment. The hydraulic hose reel was in a rear compartment on the left side of the truck. The rail was being cut ten feet away from the gas compartment.

The temperature was 25° F, and the weather was clear with a light breeze from the southwest.

The Accident

The Gang B Foreman ran the saw, and the Laborer from Gang A assisted him in setting up the saw. This Laborer was about two to three feet south of the Gang A Assistant Foreman. The Gang A Assistant Foreman was standing between Tracks Nos. 2 and 3 in front of the gas compartment with his back to the truck. Shortly after the saw started cutting rail, the gas compartment exploded. The top of the gas compartment blew off, and the door blew out, striking the Assistant Foreman. The Gang A Assistant Foreman was thrown up in the air about six to nine feet. He landed on his chest and face on the frozen ground between Tracks Nos. 1 and 2.

Immediately after the explosion, two Laborers aided the Gang A Assistant Foreman and said he was breathing and had a pulse. They covered him with their coats. At the same time, the Gang B Foreman ran to call for help, and the Gang A Foreman turned off the section truck. The Gang A Foreman saw a small fire burning the mat on the floor of the exploded gas compartment, and he put the fire out with an extinguisher.

Please see the attached diagram of the Glendale Yard to better visualize the accident scene and chain of events leading up to the fatality.

Post-Accident Investigation

An examination of the gas compartment showed little carbon on the walls of the cabinet. The acetylene tank was turned off, but the oxygen tank shut-off valve was a half turn open. Oxygen may have accumulated in the bottom of the gas compartment and mixed with a small amount of acetylene. The saw produced sparks that were thrown toward the truck. The gas compartment doors were closed, but a 2-inch drain hole in the bottom of the gas compartment may not have had a plastic plug in place. The location of the small fire in the bottom of the gas compartment was near the drain hole. A spark from the saw could have caused a mixture of oxygen and acetylene vapors in the gas compartment, exiting through the drain hole, to explode.

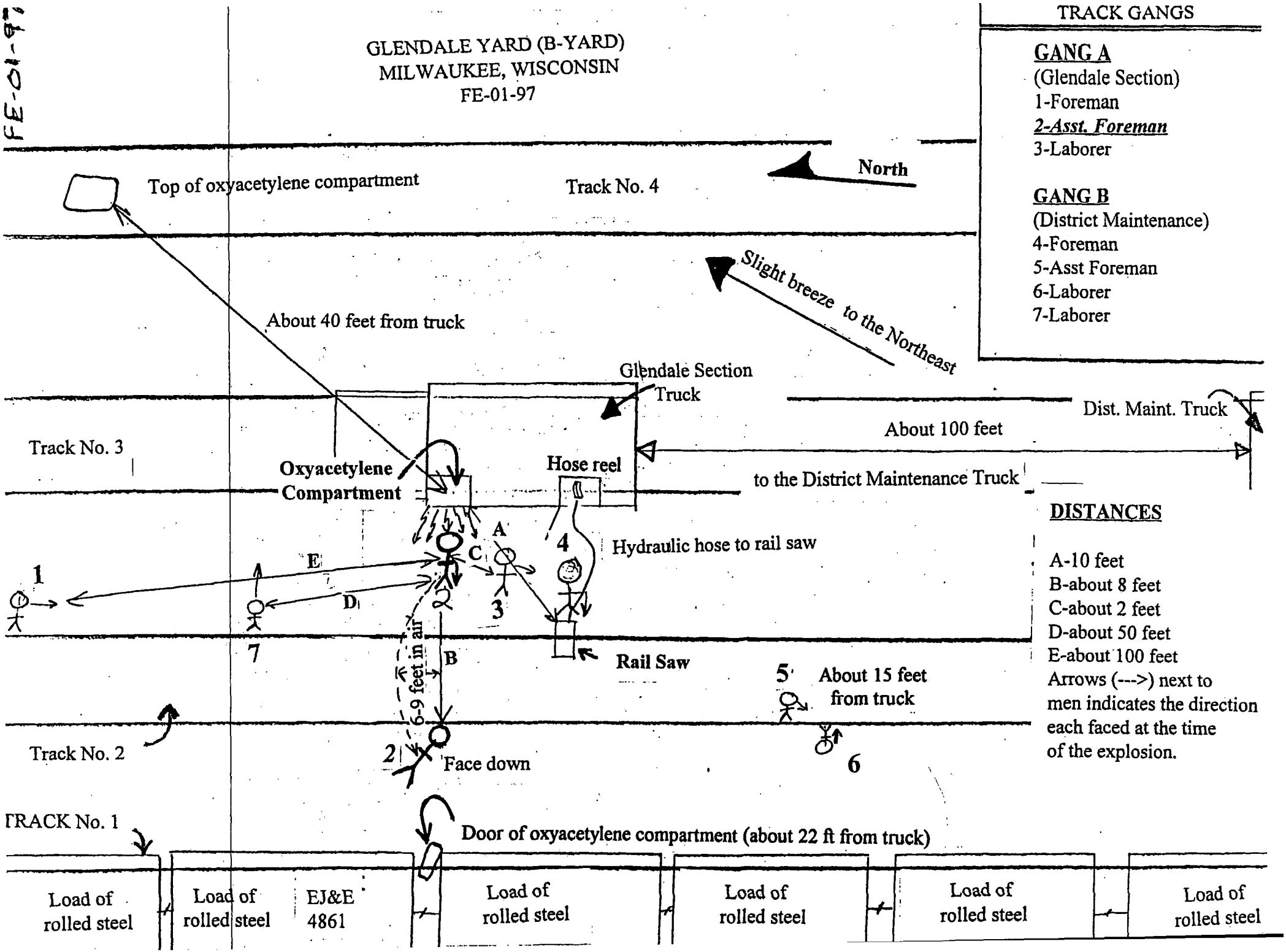
The gas compartment lacked a poster on Oxyacetylene Operation Safety, and neither torch hose was equipped with back flow valves.

The U. S. Department of Labor and the Occupational Safety and Health Administration (OSHA) conducted a concurrent investigation. OSHA issued a citation for non-compliance with the following:

> 29 CFR Part 1910.252 (a)(2)(xiii)(C): The employer did not recognize its responsibility for the safe usage of cutting or welding equipment, and did not insist that cutters or welders and their Supervisors were adequately trained in the safe operation of their equipment and the safe use of the process:
>
> (a) The employer did not assure that his Supervisors and Railroad Crew (employees) were properly trained in the safe operation and/or usage of oxygen/acetylene equipment for cutting in areas where a potential source of ignition was present.

FE-01-97

GLENDALE YARD (B-YARD)
MILWAUKEE, WISCONSIN
FE-01-97



TRACK GANGS

GANG A
(Glendale Section)
1-Foreman
2-Asst. Foreman
3-Laborer

GANG B
(District Maintenance)
4-Foreman
5-Asst Foreman
6-Laborer
7-Laborer

DISTANCES

A-10 feet
B-about 8 feet
C-about 2 feet
D-about 50 feet
E-about 100 feet
Arrows (--->) next to men indicates the direction each faced at the time of the explosion.

REPORT: FE-02-97

RAILROAD: Union Pacific Railroad Company (UP)

LOCATION: South Fontana, California

DATE, TIME: Jan. 12, 1997 , 10:15 p.m., PST

PROBABLE CAUSE: The Conductor lost his grip during a shoving move and fell in front of the lead car.

FATALLY INJURED EMPLOYEE:

Craft..... Transportation

Activity..... Switching

Occupation ..... Conductor

Age..... 60 years

Length of Service..... 35 years

Last Rules Examination..... Oct. 19, 1995

Last Physical..... Sept. 5, 1978

Last Drug Test..... Aug. 3, 1993

Circumstances Prior to the Accident

After receiving the statutory off-duty period, a Train Crew, comprising an Engineer, Conductor, and Brakeman, reported for duty on Jan. 12, 1997, at 6 p.m. PST, at Taylor Yard, in Los Angeles, California. The Crew performed deadhead service to the West Colton Yard, California, arriving at about 8 p.m. The Crew then performed the required air brake test prior to departure from West Colton Yard. The train consisted of four UP locomotives (8667, 6863, 9671, 9742,) and 50 loaded cars containing coiled sheet steel. It weighed 6,200 tons, with 124 tons per operative brake, and was 3,180 feet in length. The train departed West Colton Yard, milepost 535.0, at about 9:30 p.m., in the westward (timetable) direction, destined for the South Fontana siding.

After arriving at the east end of the South Fontana siding, milepost 530.4, at about 10 p.m., the train was diverted onto the siding and stopped. The locomotive consist was detached from the

train and moved out of the west end of the siding onto the main track, where it reversed direction eastbound, passing the train left on the siding.

The locomotive consist then re-entered the east end of the siding to couple to the rear of the train, allowing the locomotives to push the train into the Kaiser Steel Plant. The South Fontana siding had a westward descending grade of 0.64 percent.

The Engineer pulled the train eastward on the ascending grade, while the Brakeman walked westward to board the lead car. The Conductor boarded the lead car prior to the eastward movement. As the Brakeman approached the lead car he told the Engineer, via radio, to stop the train. After the train came to a stop, the Brakeman boarded the north side of Car No. CTRN 500056.

The Conductor stood on the platform on the south side of the car, holding onto the handrail. The Conductor then instructed the Engineer, via radio, to shove the train west toward Kaiser Steel.

It was dark and moderately rainy, and the temperature was 42° F.

The Accident

The shoving movement was being made at a speed of approximately 8 mph. The Engineer said that he was controlling the speed of the train by using the independent brake. The Brakeman was still positioned on the north side of the lead car, standing on the platform and holding onto the handrail. The Brakeman stated the Conductor was also still positioned on the south side of the car, standing on the platform and holding onto the handrail. After the train moved about 10 car lengths, slack action occurred, and the Brakeman saw the Conductor fall from the side of the car face down, over the south rail, in front of the train. The lead wheel on the south side of the lead car, CTRN 500056, ran over the Conductor, causing fatal injuries.

Immediately after the Brakeman saw the Conductor fall, he instructed the Engineer, via radio, to stop the train because a man was injured. The Engineer immediately made an emergency application of the train air brakes. The train came to a stop in about five car lengths. The Engineer attempted to contact someone at the West Colton Yard office via radio, but was unsuccessful. A passing eastbound train stopped at the accident scene, and the eastbound Train Crew Members were able to contact the West Colton Yard office, via radio, and inform them of the accident. Personnel at the West Colton Yard office then called 911 for emergency responders.

Please see the attached diagrams of the West Colton Yard to better visualize the accident scene and the chain of events leading up to the fatality.

Post-Accident Investigation

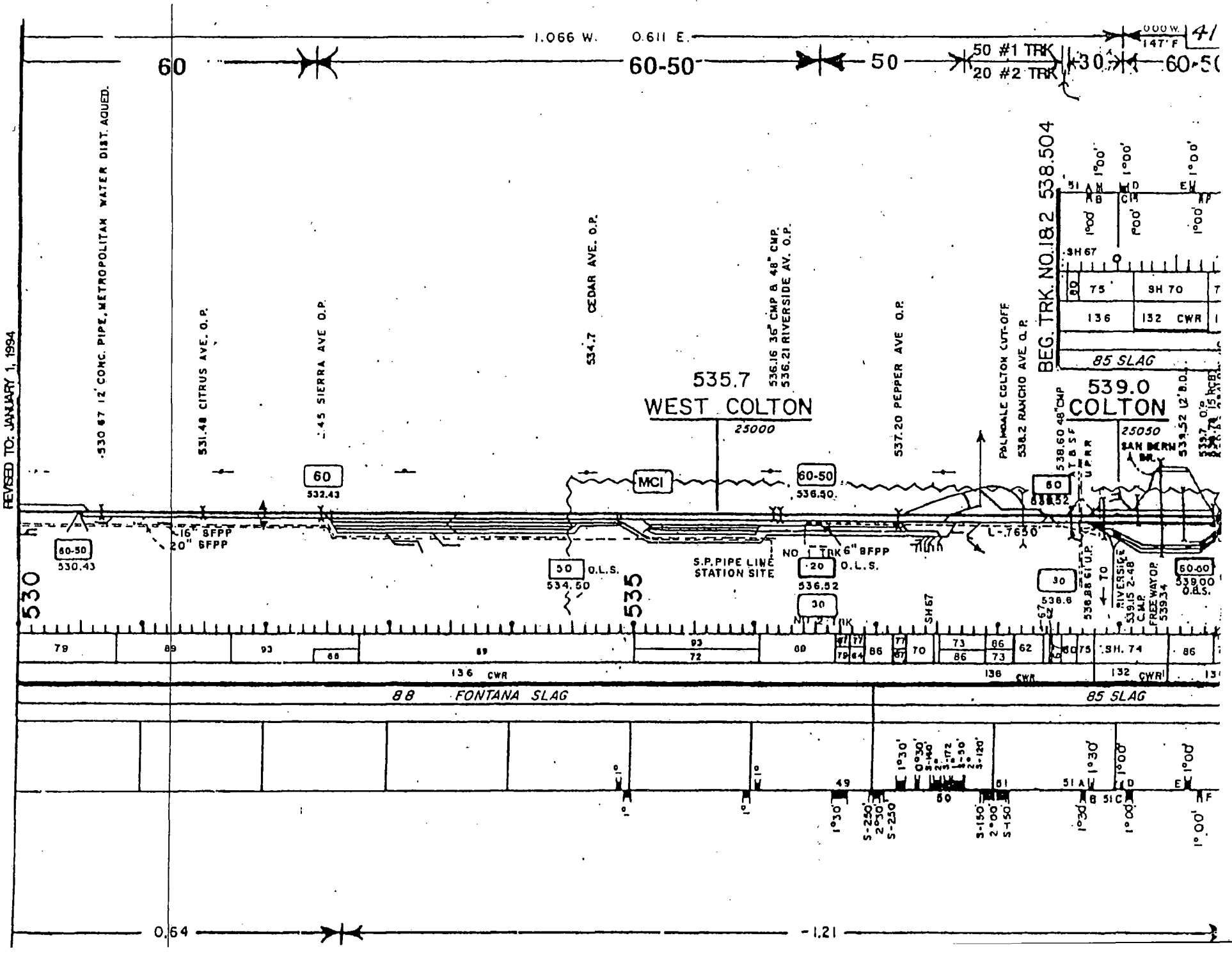
When the train was moved east and stopped, the drawbars and couplers of the 50 loaded cars were 'stretched' or in draft position. When the westward shoving move occurred, the drawbars

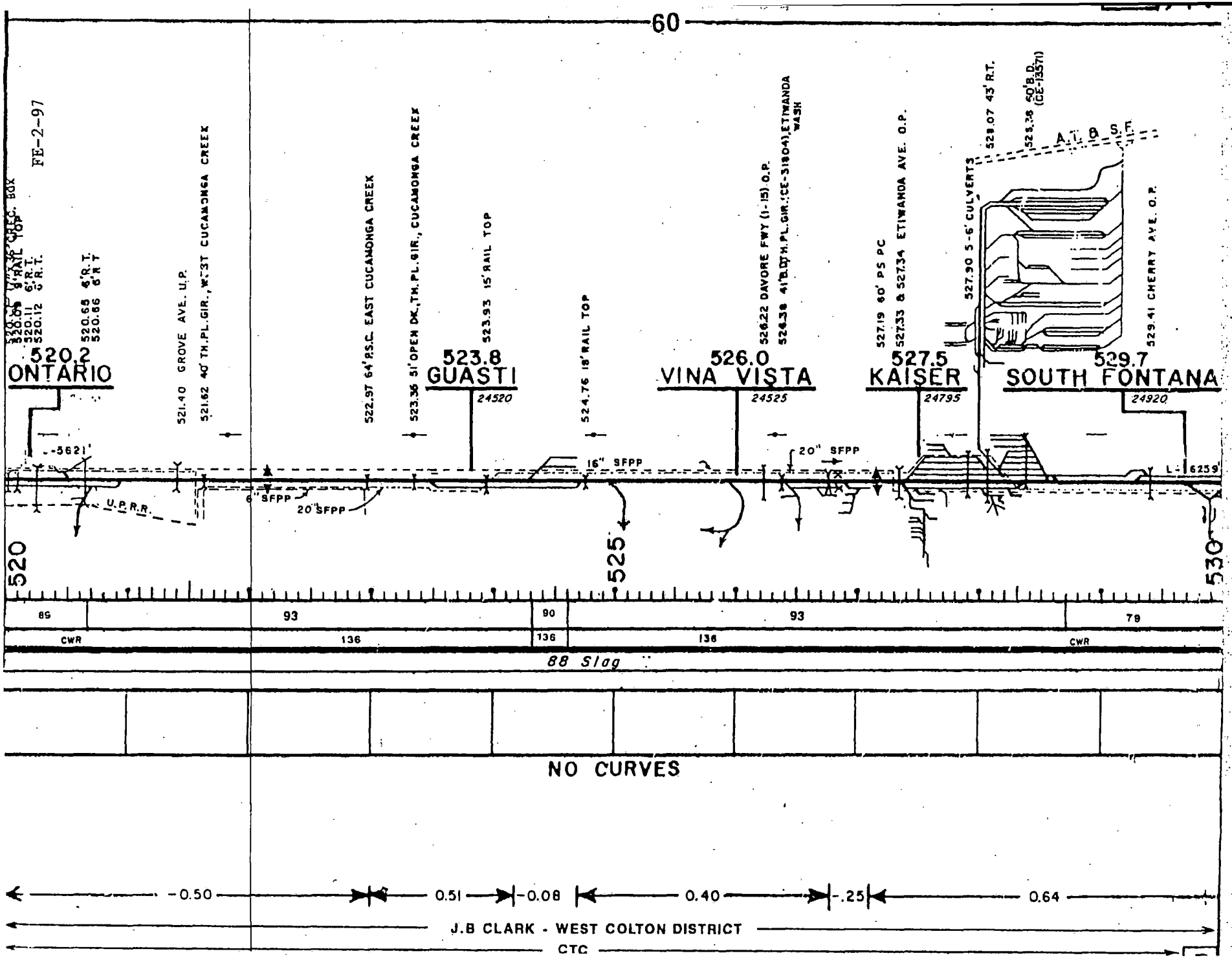
and couplers of the cars began to 'bunch' into buff position. The Engineer said he was using the independent brake to control the speed of the train. While making the shoving move, the Engineer applied the independent locomotive brake, which caused the drawbars and couplers to change rapidly from buff to draft, causing a violent surging movement. The Conductor lost his grip at this point and was projected forward, falling in front of the wheels of the lead car.

The Post-Accident Investigation revealed that the wheel of the lead car had passed over the Conductor, causing the fatal injuries. The train traveled five car lengths from the point of impact to a stop. The Conductor's body was severed at the hips. Medical emergency personnel arrived at the scene shortly after the accident occurred and pronounced the Conductor dead at the scene of the accident. The San Bernardino County Coroner indicated the cause of death was multiple blunt force injuries.

The Engineer said that he had switched at Kaiser Plant in the past, but had never done so making a shoving movement. The Brakeman said that he had never worked on a shoving move with this number of loaded cars.

Post-Accident Toxicological tests, mandated by the Federal Railroad Administration, were conducted on the Engineer, Brakeman, and the Conductor with negative results.


FE-2-97
REVISED TO: JANUARY 1, 1994
1.066 W.
0.611 E.
60
60-50
50
50 #1 TRK
20 #2 TRK
30
60-50
BEG. TRK. NO. 182 538.504
530.67 12' CONC. PIPE, METROPOLITAN WATER DIST. AQUED.
531.48 CITRUS AVE. O.P.
534.7 CEDAR AVE. O.P.
536.16 36" CMP & 48" CMP.
536.21 RIVERSIDE AV. O.P.
537.20 PEPPER AVE O.P.
PALMDALE COLTON CUT-OFF
538.2 RANCHO AVE. O.P.
538.60 48" CMP
535.7
WEST COLTON
25000
539.0
COLTON
25050
SAN BERN DR.
MCI
60
532.43
60-50
536.50
60
538.52
60-50
530.43
16" SFPP
20" SFPP
50
O.L.S.
534.50
S.P. PIPE LINE STATION SITE
NO TRK
6" SFPP
20
O.L.S.
536.52
30
NO 2 TRK
L-7650
30
536.6
RIVERSIDE 539.15 2.48 C.M.P.
FREEWAY O.P. 539.34
60-60
539.00
O.L.S.
530
535
SH 67
SH. 74
136 CWR
132 CWR
88 FONTANA SLAG
85 SLAG
0.64
1.21


60
FE-2-97
520.2
ONTARIO
523.8
GUASTI
24520
526.0
VINA VISTA
24525
527.5
KAISER
24795
529.7
SOUTH FONTANA
24920
521.40 GROVE AVE. U.P.
521.62 40° TH.PL.GIR., W.C.3T CUCAMONGA CREEK
522.97 64' R.S.C. EAST CUCAMONGA CREEK
523.36 51' OPEN DK.,TH.PL.GIR., CUCAMONGA CREEK
523.93 15' RAIL TOP
524.76 18' RAIL TOP
526.22 DAVORE FWY (I-15) O.P.
524.38 41' D.CTH.PL.GIR.(CE-31804),ETIWANDA WASH
527.19 60° PS PC
527.33 & 527.34 ETIWANDA AVE. O.P.
527.90 5-6' CULVERTS
528.07 43' R.T.
528.38 50' B.D. (CE-13571)
529.41 CHERRY AVE. O.P.
A. T. & S. F.
16" SFPP
20" SFPP
6" SFPP
20" SFPP
U.P.R.R.
520
525
530
89
93
90
93
79
CWR
136
136
136
CWR
88 Slag
NO CURVES
-0.50
0.51
-0.08
0.40
.25
0.64
J.B CLARK - WEST COLTON DISTRICT
CTC

REPORT: FE-03-97

RAILROAD: Norfolk Southern Railroad (NS)

LOCATION: Macon, Georgia

DATE, TIME: Jan. 19, 1997 - 6:40 a.m., EST

PROBABLE CAUSE: The Carman did not remain clear of moving equipment.

FATALLY INJURED EMPLOYEE:

Craft	**Maintenance of Equipment**
Activity	Establishing Blue Flag Protection while switching was being done concurrently.
Occupation	Carman (Car Inspector)
Age	42 Years
Length of Service	16 Years
Last Rules Training	Jan. 18, 1997
Last Safety Training	Jan. 18, 1997
Last Physical Examination	July 20, 1979

Circumstances Prior to the Accident

The Carman reported for duty in the forwarding yard at 11:00 p.m., the evening prior to the accident, at NS's Brosnan Yard in Macon, Georgia. His regularly assigned shift was 7 a.m. to 3 p.m. He was working this shift in overtime status. The Mechanical Department Supervisor assigned him to the south end Blue Flag protection job and instructed him to go to the south end of the yard and leave the Blue Flag protection in place on Tracks Nos. 3 and 6 after the Train Crew of Train No. G-25 had completed its move on each of those two tracks. The Carman drove the company-owned truck southward on the East Levee Road to the south end of the forwarding yard, and upon arrival, parked the vehicle near a light pole. From the point at which he parked the truck, he had to cross Tracks Nos. 9, 8, and 7 to get to his Blue Flag assignment. Upon completing the Blue Flag requirements for Track No. 6, the Carman crossed over to the switch leading to Tracks Nos. 2 and 3. He stood beside the switch while he was waiting for the locomotives of Train No. G-25 to exit the south end of Track No. 3.

Train No. G-25

Train No. G-25 was a local freight train that originated in Savannah, Georgia at 7 p.m. on Jan. 18, 1997. The Crew comprised an Engineer and a Conductor who had completed their statutory off-duty periods prior to reporting for duty. This Train Crew performed local switching duties between Savannah and Macon, and arrived at Macon Junction at 3:55 a.m. on Jan. 19, 1997.

This train remained at Macon Junction until 5:50 a.m. when the Yardmaster in the North Tower at Brosnan Yard instructed his Crew to pull through Track No. 6, make a cut, and shove the remainder of the train onto Track No. 3.

The locomotives for Train No. M-98 were being backed onto Track No. 1, to couple to the train simultaneously as the Crew of Train No. G-25 was moving its train onto Track No. 3.

The Carman was last observed by the Conductor of Train No. G-25 standing west of the switch for Tracks Nos. 2 and 3, as the Conductor uncoupled the locomotives from the cars that remained on Track No. 3. The Carman and Conductor waved to each other at this time, and according to the Conductor, everything appeared to be normal. The locomotives for Train No. M-98 were moving northward on Track No. 1 during the time of the Conductor's observation.

Train No. M-98

Train No. M-98 was a southbound freight train originating at Macon on the day of the accident. The Crew of this train comprised an Engineer and a Conductor who had completed their statutory off-duty periods prior to reporting for duty. They went on duty at the engine terminal at 6 a.m. on Jan. 19, 1997. The train was assigned three locomotives, NW8067 (General Electric Model C-30-7), SOU3208 (Electro-Motive Division (EMD) Model SD-40-2), and NW6143 (EMD Model SD-40-2), coupled in multiple unit control, from south to north.

The Crew of this train received instructions to depart the engine terminal at 6:25 a.m. They proceeded southward on Thoroughfare No. 2 to the switch for the south crossover to the forwarding yard. When the locomotives arrived at the south end of the forwarding yard lead, the Yardmaster in the North Tower instructed the Crew to back onto Track No. 1 and couple to its train. This Crew was backing northward with the three light locomotives onto Track No. 1.

The tracks in the south yard extended northward and southward and were numbered One through Nine, beginning from Thoroughfare No. 2. The yard lighting in the area of the accident consisted of a single pole light, east of the accident area, and located between Track No. 9 and the East Levy Road.

The ambient temperature at the time of the accident was 28° F. No atmospheric condition limited visibility.

The Accident

As the Carman was standing near the switch between Tracks Nos. 2 and 3, waiting for the locomotives of Train No. G-25 to pull southward out of the track, the locomotives of Train No. M-98 were passing him, moving northward on Track No. 1. For an undetermined reason, the Carman apparently fouled Track No. 1 and was struck by the locomotives of Train No. M-98 as they moved northward. The body of the Carman was discovered by the Crew Members of Train No. G-09 as the train pulled southward out of Track No. 2 at approximately 6:55 a.m., and they notified the Main Tower of their discovery via radio. There were no eye witnesses to the accident.

The Bibb County Medical Center Emergency Medical Service (EMS) arrived at the accident site, and an EMS paramedic pronounced the Carman dead at 7:16 a.m. The cause of death was multiple blunt and crush injuries with the trunk of the body transected. The Bibb County Coroner declared the manner of death as an accident.

Please see the attached diagrams of Brosnan Yard to better visualize the accident scene and chain of events leading up to the fatality.

Post-Accident Investigation

The company truck assigned to the Carman for this tour of duty was found parked near the switches leading to the forwarding yard. The Carman had left his hard hat, safety glasses, and hand-held, battery-powered light on the seat of the truck. He was apparently attempting to perform his assigned duties while utilizing illumination supplied by the pole-mounted light in the yard near his location.

Re-enactment of the circumstances surrounding this accident revealed that it was dark when the accident occurred, and the Carman would have been dependent on the lighting generated from the pole-mounted light since he did not have his hand-held light with him. The re-enactment also demonstrated that if both train's locomotive consists were passing the switch to Tracks Nos. 2 and 3 at the same time, illumination from the pole-mounted light would have been diminished to the point that a person standing near the switch would have been in almost total darkness. The noise from both locomotive consists may have made it impossible to hear the audible warning (bell) from Train No. M-98.

The Carman was wearing layered clothing with a stocking-type cap and a hooded sweatshirt at the time of the accident. His outer clothing was dark in color. It is unknown if the stocking cap and hooded sweatshirt he was wearing at the time had reduced his ability to hear. He also had gloves and a radio with him. His gloves and radio were found in the gage of the track north of

the point of impact. His transected body was found approximately 191 feet north of the switch to Tracks Nos. 2 and 3. His upper torso was found in the gage of Track No. 1, while his lower portion was found outside the gage of the east rail.

Toxicology samples were obtained from the deceased Carman, Engineer, and Conductor of Train No. M-98 and were tested under the authority of 49 CFR Part 219, Subpart C. Results of all tests were negative.

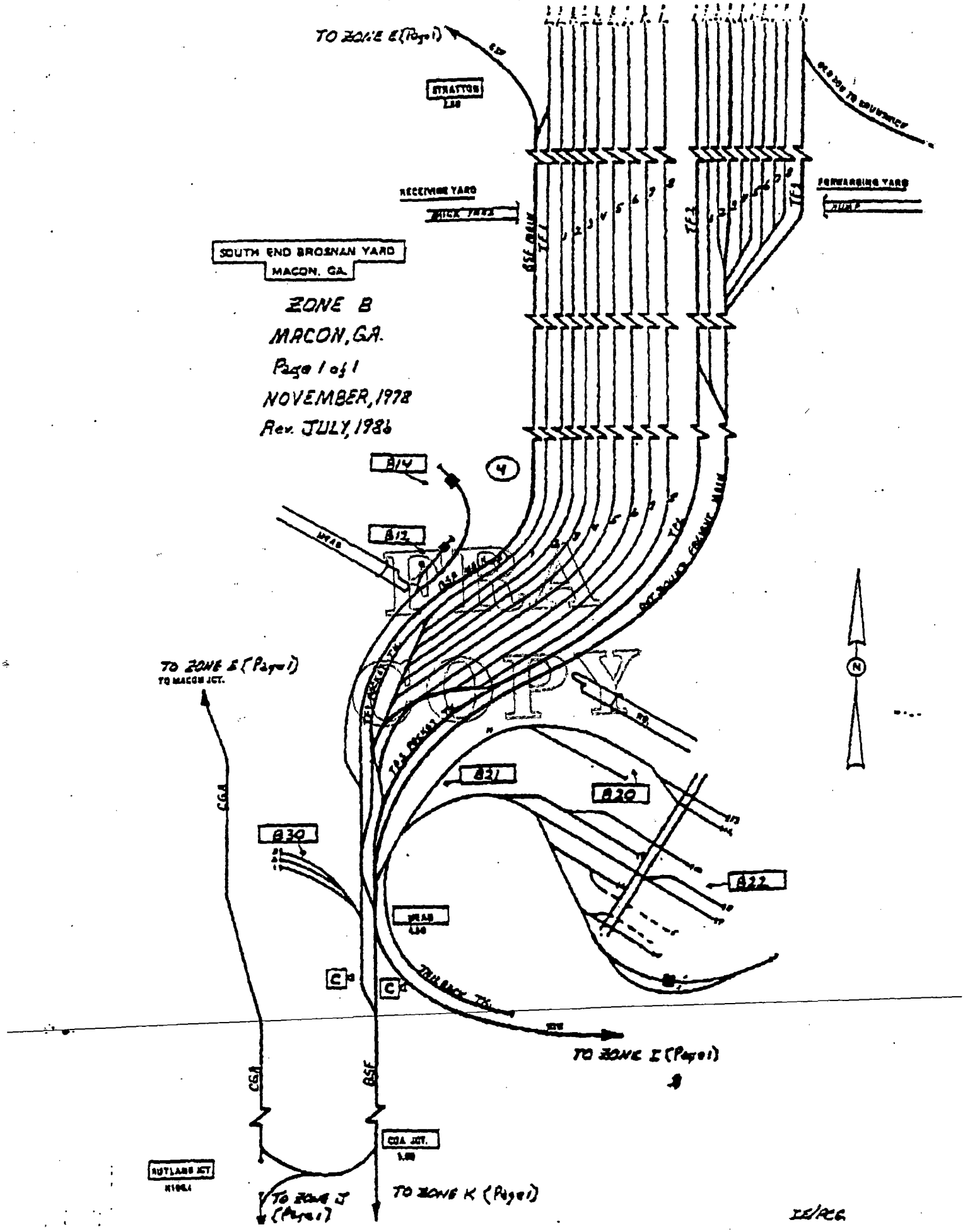
Evidence observed on Locomotive NW 6143 of Train No. M-98 indicated that it had passed over the Carman's body. The Engineer was operating from the control stand from the west side of the south unit (NW 8067). The locomotive consist was moving northward onto Track No. 1 to couple to its train. The Conductor was controlling the northward movement of the locomotives from the cab of Locomotive NW 6143; he was seated on the west side. The Conductor's view of the track in the direction of movement was hampered by the long hood end of Locomotive NW 6143.

There is conflicting information over whether the headlight was illuminated in the direction of movement. The Engineer of Train No. M-98 stated that he usually turned on the headlight at each end of the locomotive consist prior to departing the engine terminal. During an interview, he recalled not having to turn on the headlights because they were already illuminated. However, the Engineer and Conductor of Train No. G-25 stated that they did not observe an illuminated headlight on Train No. M-98's rear unit, nor did they hear the bell being sounded as they passed it. The investigation revealed that the Engineer on Train No. M-98 had been cited during a Safety Audit performed on Dec. 30, 1996 at Brosnan Yard for not having his locomotive headlight illuminated as required by Operating Rule No. 17.

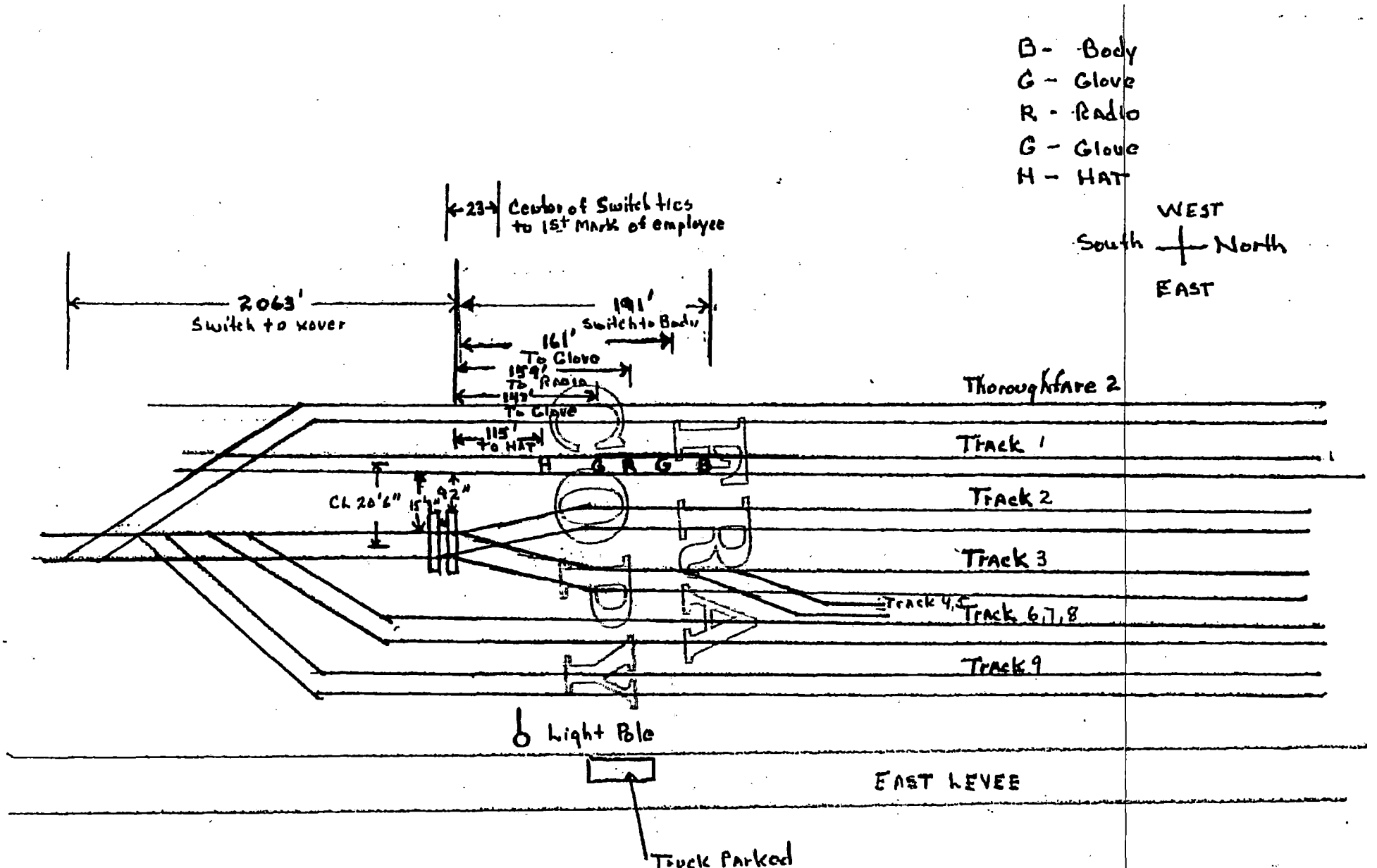
Analysis of the speed/event recorder data removed from the locomotives indicated that Train No. M-98's locomotives made the reverse move onto Track No. 1 at approximately 6:40 a.m.

According to those with whom the deceased had worked during the night, the shift had been a routine tour until the Carman was given his last assigned flagging duty for the night. The majority of the mechanical force agreed that the Yardmasters in the towers habitually had attempted to notify all affected parties of yard movements whenever possible; however, no one could recall hearing a notification of this movement.

Additionally, the Carman was standing in darkness and did not have a hand-held light with him. Nor was he wearing any reflective equipment that would have enabled the Crew of Train M-98 to be aware of his presence. The sound from the locomotives of Train No. G-25 in close proximity to the Carman may have masked the sound of the approaching locomotives of Train M-98, leaving him unaware of their approach to his location.


TO ZONE E (Page 1)
STRATTON
RECEIVING YARD
BRICK YARD
FORWARDING YARD
SOUTH END BROSNAN YARD
MACON, GA.
ZONE B
MACON, GA.
Page 1 of 1
NOVEMBER, 1978
Rev. JULY, 1986
B14
B12
WEAS
TO ZONE E (Page 1)
TO MACON JCT.
B21
B20
B30
B22
WEAS
TO ZONE I (Page 1)
CSA
BSF
CSA JCT.
BUTLAND JCT.
TO ZONE J (Page 1)
TO ZONE K (Page 1)
N

JC/RCG


B - Body
G - Glove
R - Radio
G - Glove
H - HAT
WEST
South
North
EAST
23' Center of Switch ties to 1st Mark of employee
2063' Switch to Mover
191' Switch to Body
161' To Glove
154' To Radio
142' To Glove
115' To HAT
H G R G B
CL 20'6"
15'4"
92"
Thoroughfare 2
Track 1
Track 2
Track 3
Track 4,5
Track 6,7,8
Track 9
Light Pole
EAST LEVEE
Truck Parked

REPORT: FE-04-97

RAILROAD: Union Pacific Railroad Company (UP)

LOCATION: Mason City, Iowa

DATE/TIME: Jan. 29, 1997 - 12:55 a.m., CST

PROBABLE CAUSE:

Failure of employees (Conductor and Engineer) to properly communicate/acknowledge, via company radio, directions involving a backing movement.

EMPLOYEE:

Craft	**Transportation**
Activity	Switching
Occupation	Conductor
Age	48 years
Length of Service	28 years
Last Rules Training	March 8, 1996
Last Safety Training	Jan. 24, 1996
Last Physical Examination	April 9, 1987

Circumstances Prior to the Accident

On Jan. 29, 1997, the Crew of UP's Local Freight Train LTT21-29, comprising an Engineer and Conductor, went on duty at 8 a.m. CST in Blue Earth, Minnesota. Both Crew Members had received the required off-duty time prior to being called for duty (off duty on 1/28/97 at 9:10 p.m. CST).

Train LTT21-29 was operated from Blue Earth to Mason City, Iowa, without incident and arrived at Mason City at 12:40 a.m. with three locomotives (UP 5541, UP 4317, and UP 3535), all positioned with the long hood forward (southbound) and coupled to nine cars. The Crew was instructed by the Mason City Yardmaster to cut off the nine cars on the north end of Yard Track No. 1 (west side of the main track), and set out the two trailing locomotives (UPB 4317 and UP 3535) on the fueling track, which is referred to by local Crews as the Come-Out Track (east side of the main track).

The Engineer was at the controls of the Lead Locomotive UP 5541 as the Conductor made the cut on the north end of Yard Track No. 1. The Conductor boarded the trailing locomotive and rode to the south end of Yard Track No. 1, where it rejoined the main track. The switch on the south end of Yard Track No. 1 was lined for the movement and the three locomotive consists operated southward back onto the main track. The Conductor then de-boarded the trailing locomotive (the most northward locomotive) and re-positioned the switch on the south end of Yard Track No. 1 for movement northward on the main track. The Conductor re-boarded the trailing locomotive (UP 3535) and rode the steps on the point of the shove northward toward the Come-Out Track.

The Engineer reported the switches were all properly aligned for movement onto the yard on the east side of the main track and beyond onto Yard Track No. 12. The Engineer, still aboard UP 5541 with the cab end headed north, reported he had received hand signals from the Conductor throughout the shove until they arrived at Switch 504 leading onto the Come-Out Track. At this point, the Conductor gave a hand signal for the Engineer to stop.

After the movement stopped, the Conductor de-boarded from his position on the steps of UP 3535 and walked to Switch 504, which led to the Come-Out Track. After finding Switch 504 locked out and the track Blue-Flagged, the Conductor began walking northward toward the next switch (Switch 505). The Engineer reported the locomotive consist was positioned on a slight curve, and the Conductor left his sight after a short distance.

A short time later, the Engineer heard on the company radio what he assumed to be a transmission from the Conductor which said "Come ahead, 21." The Engineer began shoving north, assuming the Conductor had arrived, and positioned the next switch (Switch 505) for movement onto what the Engineer called the "Pit Track."

The weather was clear, with light northerly winds of around 10 mph. The temperature was about 0° F, and the ground was covered by snow.

The Accident

The Engineer stated he continued to shove northward until he could see the movement was not entering the pit track at Switch 505. He then tried to radio the Conductor, saying "Where are we going, Pat?"

When he received no response, he again radioed "Hello, Pat." With still no response, the Engineer stopped the locomotive consist, put on his coat, and de-boarded the locomotive to investigate. As he walked from the locomotive, he could see the body of the Conductor under the north truck of the middle or second locomotive.

The Engineer later stated that he ran back to the controlling locomotive and called the Yardmaster on the radio. He was unsure of what he said, but remembered the Yardmaster telling

him to use the emergency call buttons 911 on the radio to contact the Chief Dispatcher. The Chief Dispatcher came on the radio within 30 seconds after he did this, and the Engineer reported the circumstances. The Chief Dispatcher called emergency response personnel, who arrived at the scene within minutes.

Please see the attached diagram of the Mason City West Yard to better visualize the accident scene and the chain of events leading up to the fatality.

Post-Accident Investigation

The Conductor was pronounced dead at the scene of the accident by the Cerro Gordo County Medical Examiner. The body was later removed and taken to North Iowa Mercy Hospital in Mason City, Iowa, where FRA mandatory toxicological tests were performed. FRA mandatory toxicological tests were also performed on the Engineer. Results of these tests were negative for both employees for the presence of drugs or alcohol.

An Officer from the Mason City Police Department started his investigation immediately following the accident. The Police Investigator indicated he was able to trace the Conductor's footprints in the snow leading from Switch 504 northward along the east side of the Come-Out Track for approximately 130 feet. The footprints then crossed over the Come-Out Track and continued northward in between the Come-Out Track and Yard Track No. 12 for approximately 40 feet, at which point they crossed onto the middle of Yard Track No. 12.

The footprints continued for a distance of approximately 12 feet to the point where the Conductor was struck from behind by the locomotive consist. The Conductor's body came to rest at a point approximately 150 feet north of the point of impact.

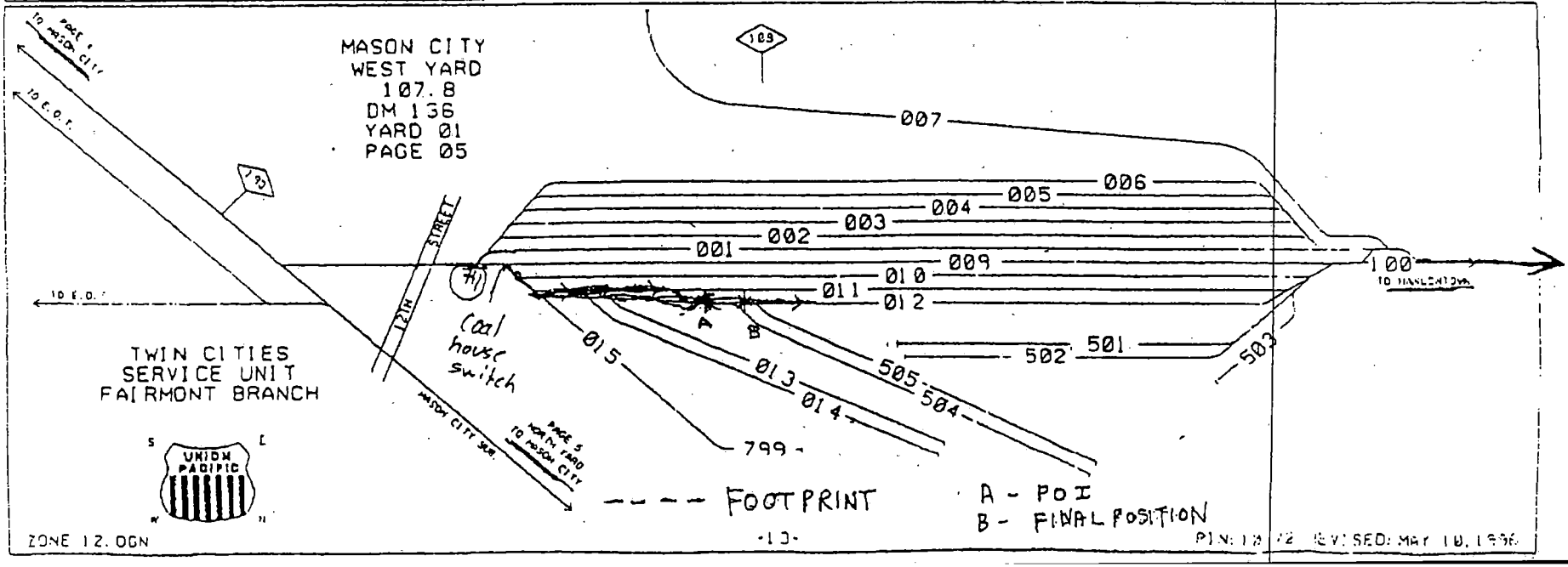
Railroad officials who accompanied the Police Investigator indicated all of the Conductor's footprints were facing northward. This would indicate that at no time did he stop or turn around to look toward the approaching locomotive consist.

During his interview, the Engineer of LTT21-29 indicated it was the normal practice for the Conductor to wear his ear plugs while performing switching movements. Due to the severity of his injuries, it could not be determined whether the Conductor was wearing ear protection when he was struck. The Engineer stated the Conductor had been wearing a green ball cap. The Engineer also indicated that he was not ringing the bell prior to or at the time of the accident, nor did he acknowledge the Conductor's radio transmission to "Come ahead 21" either verbally or through use of a whistle signal.

Serv. Int

436-7663 P
436-7667 F

ZTS TRK. NO.	NAME	CONTRACT NO.
MASON CITY, IA. - DM 136 - PGS 4-6, 13&26		
001	#1 WEST YD.	
002	#2 WEST YD.	
003	#3 WEST YD.	
004	#4 WEST YD.	
005	#5 WEST YD.	
006	#6 WEST YD.	
007	BLUE RIBBON	
009	MAINLINE WEST YD.	
010	NEW TRK.	
011	CLASSIFICATION TRACK	
012	COAL HOUSE TRACK	
013	CLASSIFICATION TRACK	
014	NEW RAMP	
015	NIXON	
100	MAINLINE	
501	RIP 1 TRACK	
502	RIP 2 TRACK	
503	RIP 3 TRACK	
504	COME OUT TRK	
505	PIT TRK	
799	MASON CITY BY-PRODUCTS	



ZONE 12. DGN

PLN: 12 REVISED: MAY 10, 1996

REPORT: FE-05-97

RAILROAD: Consolidated Rail Corporation (CR)

LOCATION: Burns Harbor, Indiana

DATE, TIME: Feb. 2, 1997 at 9:55 p.m., EST

PROBABLE CAUSE:

The Yard Conductor was fouling Track No. 7 when he was struck by freight cars during a shoving movement.

EMPLOYEE:	**Craft**.....	**Transportation**
	Activity.....	Switching
	Occupation.....	Yard Conductor
	Age.....	54 years
	Length of Service.....	27 years
	Last Rules Test.....	Jan. 29, 1996
	Last Safety Training.....	Jan. 29, 1996
	Last Physical Exam.....	Jan. 31, 1992

Circumstances Prior to the Accident

TRAIN WDBH-63 (Job 63)

After having received the required statutory off-duty period, a Train Crew, comprising a Yard Conductor, Yard Brakeman, and Locomotive Engineer, reported for duty at 6 p.m., Feb. 2, 1997, at the CR Yard Office in Burns Harbor, Indiana. The employees were assigned to work on Job 63. They received a job briefing and were instructed on the Safety Rule of the Day by the Trainmaster on duty, whereupon they departed the yard office and began to switch cars in the yard.

This assignment required the employees to switch out and classify cars in the yard, and deliver, pull, and spot cars at the Midwest Steel Company and the Bethlehem Steel Company. The employees started their tour of duty by switching out cars in the classification yard and making up a small train for the Midwest Steel Company. They then delivered and pulled cars at that location. The employees had returned to the yard with several cars when they were

contacted by the Trainmaster who wanted to know their location and progress. The Trainmaster instructed the Crew to finish switching the cars from the Midwest Steel Company, and return to the yard office via the lead track for further instructions.

In the accident area, timetable directions were east and west. Burns Harbor Yard consisted of 21 tracks and the method of operation was NORAC Operating Rule 80 which stated:

> Movements made at Restricted Speed must apply the following requirements as the method of operation:
>
> (1) Control the movement to permit stopping within one half the range of vision short of obstructions; and
>
> (2) Do not exceed the maximum speed prescribed by Timetable or other written directives, not exceeding 20 mph outside interlocking limits and 15 mph within interlocking limits.

Burns Harbor Yard was located at the CR's Dearborn Division, on the Chicago Line between CP 483 and CP 487. CR Timetable No. 4's Special Instructions designated Burns Harbor Yard as a "restricted speed area," where speeds must not exceed 10 mph. The accident area was well lit with an arrangement of 12 large pole lights spaced 85 feet apart along the lead track. Lead Track No. 324 extended from east to west and turned onto Track No. 624 as it extended past the yard office. There were 19 tangent, parallel tracks, utilized as classification and repair tracks, and all tracks were accessible off of the lead.

The Conductor was working near the north rail of Track No. 607 (also called Track No. 7), approximately 295 feet west of the switch controlling the entrance to the track.

The weather conditions were clear. The ambient temperature was 30° F.

TRAIN WDBH-61 (Job 61)

After having received the required statutory off-duty period, a Train Crew, comprising an Engineer, Conductor, and Brakeman, reported for duty at 6:30 p.m., on Feb. 2, 1997, at CR Burns Harbor Yard. The Train Crew received a job briefing and the Safety Rule of the Day was discussed. The Job 61 Crew was assigned to pull 28 hoppers from Bethlehem Dumper, and place them on Track No. 15 in the yard. The Crew was assigned to switch the Midwest Steel Company and then switch Track No. 2 in the yard to make up Train "BHEL" (Burns Harbor-Elkhart).

The Job 61 Crew completed their first two assignments at 9:30 p.m. and then went to the yard office at Burns Harbor for further instructions. The Crew was next assigned to get 21 cars out of Track No. 7 and take them to the Bethlehem Steel Company. The Crew left the yard office, tied

onto the cars on Track No. 7, and proceeded east out of the yard toward the Bethlehem Steel Company. When the Crew Members arrived at the Bethlehem Steel Company, the Conductor noticed that they did not have all of their cars. He notified the Burns Harbor Yardmaster, and requested that he be allowed to return to the yard to retrieve the remaining cars.

While the Job 61 Crew Members were returning from the Bethlehem Steel Company, they were notified by the Trainmaster that the Job 63 Crew was going to be in the yard, and would be in the clear on the lead in front of the yard office.

At 9:40 p.m., the Job 61 Crew again coupled onto the cars on Track No. 7. The Conductor instructed his Brakeman on how he wanted the cars switched and told him to pull pins and operate the switches. It was at this time that the Conductor noticed the Job 63 Crew switching cars onto Track No. 24.

At approximately 9:50 p.m., the Job 61 Conductor observed the Job 63 Conductor standing just north of Track No. 8 and just south of where the locomotives were parked on the lead track. The Job 61 Conductor walked over to the Job 63 Conductor and told him he would be out of his way in about five minutes. He then left and proceeded to walk south toward Track No. 8 to continue switching cars.

The Conductor for Job 63 waited for the Job 61 Crew to finish switching and making up their outbound train on Tracks Nos. 7 and 8 in the yard. While waiting, he informed his Brakeman of the conversation with the Conductor for Job 61, and told his Brakeman that he could wait on the locomotive until he was needed. The Brakeman then boarded the locomotive.

The Accident

As the Job 61 Crew was shoving cars west onto Track No. 7 at a recorded speed of 11 mph, the Brakeman for Job 63 was seated in the cab of the locomotive that was parked on the lead. He looked out the cab window of the locomotive and noticed that his Conductor was standing next to Track No. 7. The Conductor appeared to be studying his work order and periodically looked in a westward direction toward the yard tracks. While the Brakeman was observing his Conductor standing next to Track No. 7, he caught a glimpse of a cut of cars moving west. In the next moment, he witnessed the west car strike his Conductor who was standing just north of the north rail on Track No. 7.

Upon witnessing the impact, the Brakeman for Job 63 initiated an emergency distress call to the Engineer for Job 61. He made several transmissions on his radio before he realized that he was transmitting on Channel Three, and that the Job 61 Crew was working on Channel Two. He switched to Channel Two, made several more transmissions using the distress call of "Emergency," and told the Engineer for Job 61 to stop his train.

The Engineer for Job 63 stood up and looked out of the window as his Brakeman left the locomotive. He observed a cut of cars moving west onto Track No. 7 and observed cars rolling over his Conductor. The Engineer could see the Conductor trying to kick away from the cars that were rolling over him. The Engineer grabbed his radio and started transmitting the distress call "Emergency." After he received an acknowledgment over the radio from the Engineer for Job 61, he immediately alighted from the locomotive and headed toward the scene of the accident.

At 9:55 p.m., the second and third trick Trainmasters were in the process of a shift change. Both Trainmasters overheard several distress calls on radio channels two and three. The second trick Trainmaster was looking out of a large plate glass window overlooking the yards, and observed cars in movement from east to west, but his view was obstructed by the two locomotives parked in front of the yard office. He immediately radioed the Engineer of the Job 61 Crew, instructing him to stop his train. Both Trainmasters then departed the yard office and proceeded toward the scene of the accident.

The Engineer for Job 61, after hearing emergency transmissions followed by instructions to stop his train, brought his locomotive to a stop 390 feet west of the accident site.

At 9:56 p.m., the Yard Clerk at Burns Harbor, overhearing the radio transmissions between the yard office and the Crew Members of Jobs 61 and 63, telephoned the Bethlehem Steel Company's emergency response center and requested emergency assistance. An ambulance was immediately dispatched from the Bethlehem Steel Company, arriving at the scene at approximately 10 p.m. The ambulance transported the injured Conductor to Porter Memorial Hospital, Valparaiso, Indiana, arriving there at 10:38 p.m. After repeated attempts by Porter Memorial Hospital personnel to save the injured Conductor, he died at 12:20 a.m. on Feb. 3, 1997.

Please see the attached five diagrams of the Burns Harbor Yard to better visualize the accident scene and chain of events leading up to the fatality.

Post-Accident Investigation

Evidence indicates that the Conductor for Job 63 was fouling the north rail of Track No. 7 when he was knocked down by the lead car of a 15-car cut that was being shoved westward onto Track No. 7 by the Job 61 Crew. The Conductor was run over by four freight cars and dragged approximately 30 feet.

According to the Brakeman for Job 63, who was the only person to witness the accident, the Conductor for Job 63 was standing just north of Track No. 7, and appeared to be glancing down at his work order. At the same time, he was looking westward and did not appear at any time to look in the direction of the oncoming cars rolling toward him on Track No. 7.

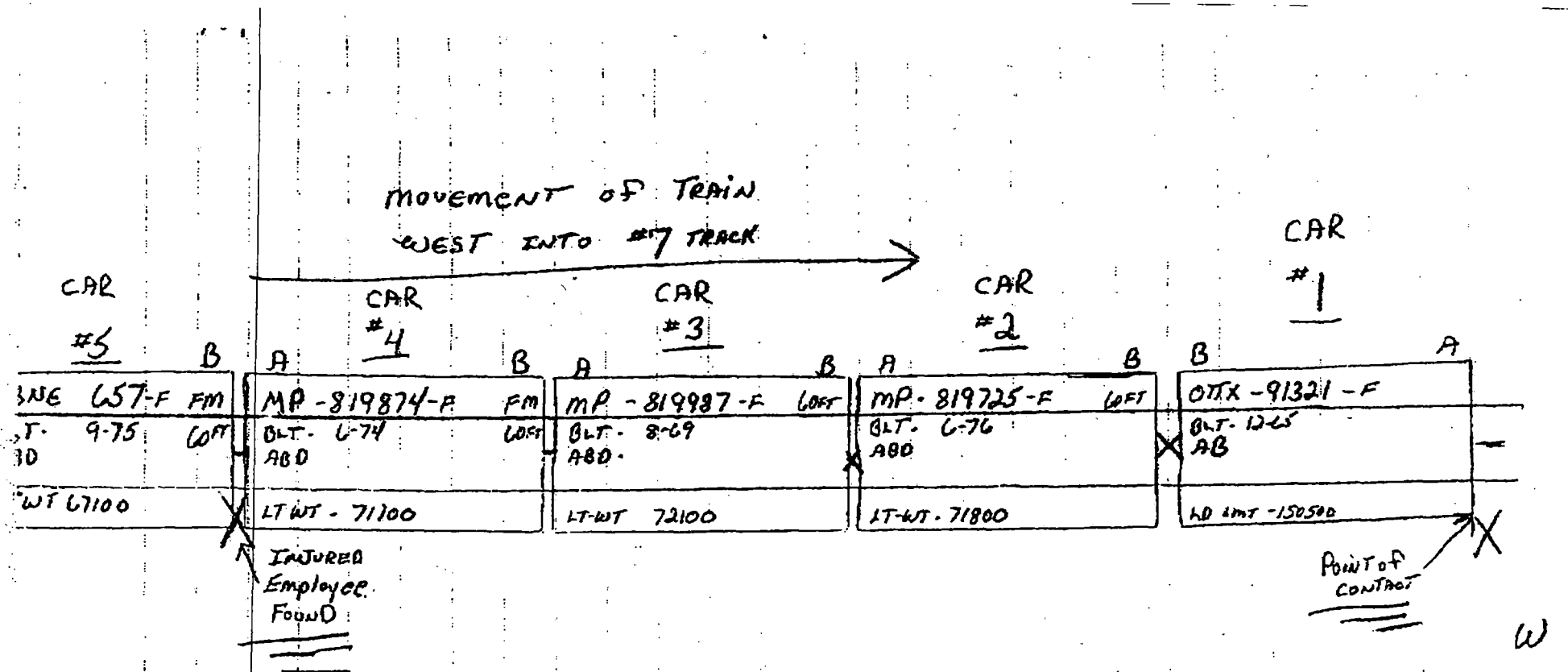
The Engineer for Job 63 said the last time he observed the Job 63 Conductor was just moments prior to the accident, when the Conductor had crossed in front of the locomotives in a southward direction. The Engineer stated that he was not in a position to observe where the Conductor was standing at the time of impact. He stated that he was startled by the actions of his Brakeman, who suddenly stood up from his seat in the locomotive and rushed out the door, shouting "Emergency, Emergency!" The Engineer stated that as the Brakeman was departing the cab of the locomotive, he (the Engineer) stood up and looked out of the window and saw his Conductor being run over by several cars that were rolling westward on Track No. 7.

The Conductor and Brakeman for Job 61 said they were walking along the north side of the lead, east of Switch No. 6, while their train was being shoved west onto Track No. 7. During this time, they heard emergency radio transmissions, followed by instructions being relayed to their Engineer for Job 61 to stop his train. The Conductor for Job 61 said the last time he saw the Conductor was just moments before the accident when he had a brief conversation with him. He said the Job 63 Conductor was standing just south of the locomotives that were sitting in front of the yard office on the lead. The Job 61 Conductor said he had walked over to where the Job 63 Conductor was standing and had notified him that he would be out of his way in five minutes. The Job 61 Conductor also stated that just prior to making the reverse movement onto Track No. 7, he again looked to see if the track was clear. He did not see any sign of the Job 63 Conductor at that time.

The Engineer for Job 61 said he was instructed to make a reverse movement onto Track No. 7, a clear track, to pick up his Crew Members. The Engineer stated that while shoving his train, he heard several different emergency transmissions over the locomotive radio and was instructed to stop his train. He stated that he was traveling at about 10 mph and had initiated an emergency air brake application. The Conductor for Job 61 said that at the time of the accident, the train was shoving 21 cars onto Track No. 7, which was thought to be a clear track.

A physical check of the cars on Track No. 7, immediately following the accident, revealed that the Job 61 Crew had shoved 15 cars of their 21-car train westward onto Track No. 7. The physical check also indicated that at the time of the accident, Track No. 7 contained six cars which previously had been switched by the Job 61 Crew. Evidence indicated that the 15th car (OTTX 91321EF) had struck the Conductor for Job 63, knocking him down and dragging him 30 feet. Four freight cars then ran over him, resulting in his death.

The Job 61 Engineer, Conductor, and Brakeman were tested, using Federal forms and authority. Tissue samples from the remains of the Job 63 Conductor were also tested. FRA's investigation revealed that CR could not utilize Federal authority because testing took place before it would have been a qualifying event (the Conductor was still alive). Therefore, FRA was compelled to cancel all testing due to errors in authority for collection and numerous errors in documentation. Toxicological testing was also performed on the deceased by the Porter County Coroner's Office and the specimens were sent to Great Lakes Laboratories. The results were negative.



CAR-INSPECTION
REPORT MADE OUT
ON-OTTX 91321 only

← 101 →

BURNHARBOR. 2/3/97
WDBH-61
TRK #7

X indicates Hose Coupled
— indicates Hose NOT Coupled.

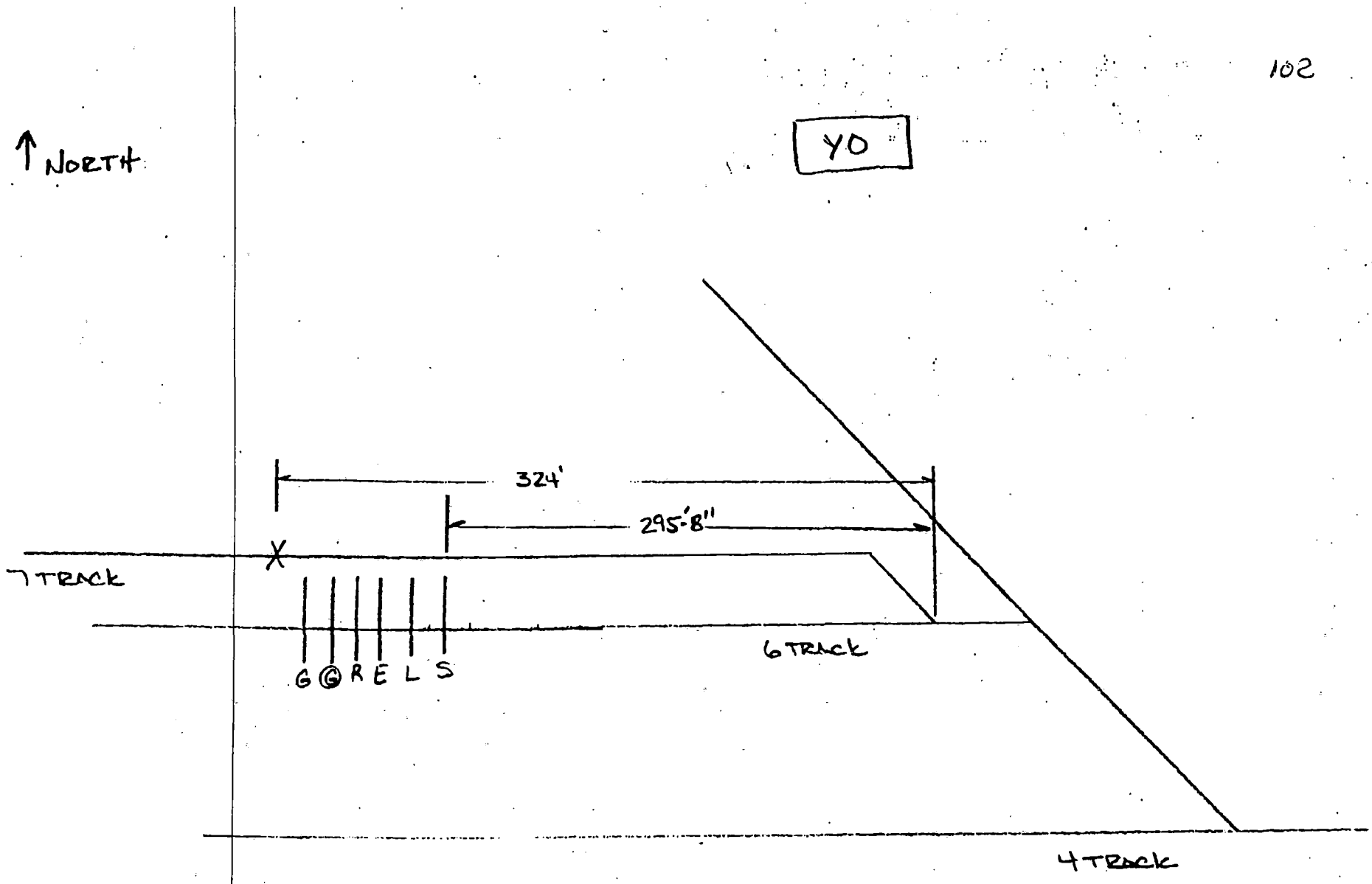
	CAR #7	CAR #8	CAR #7	CAR #6
ENG 1694	BN-565564-G-E BLT-3-72 LT-WT -60400	BN-614295 BLT-12-65 RCD-11-78 ABD LT WT - 25300	IHB-2100 BLT-8-59 RCD-4-79-CR-AC AB LT-WT -6200	IHB-18191-F G BLT-1-77 ABD-

E

101

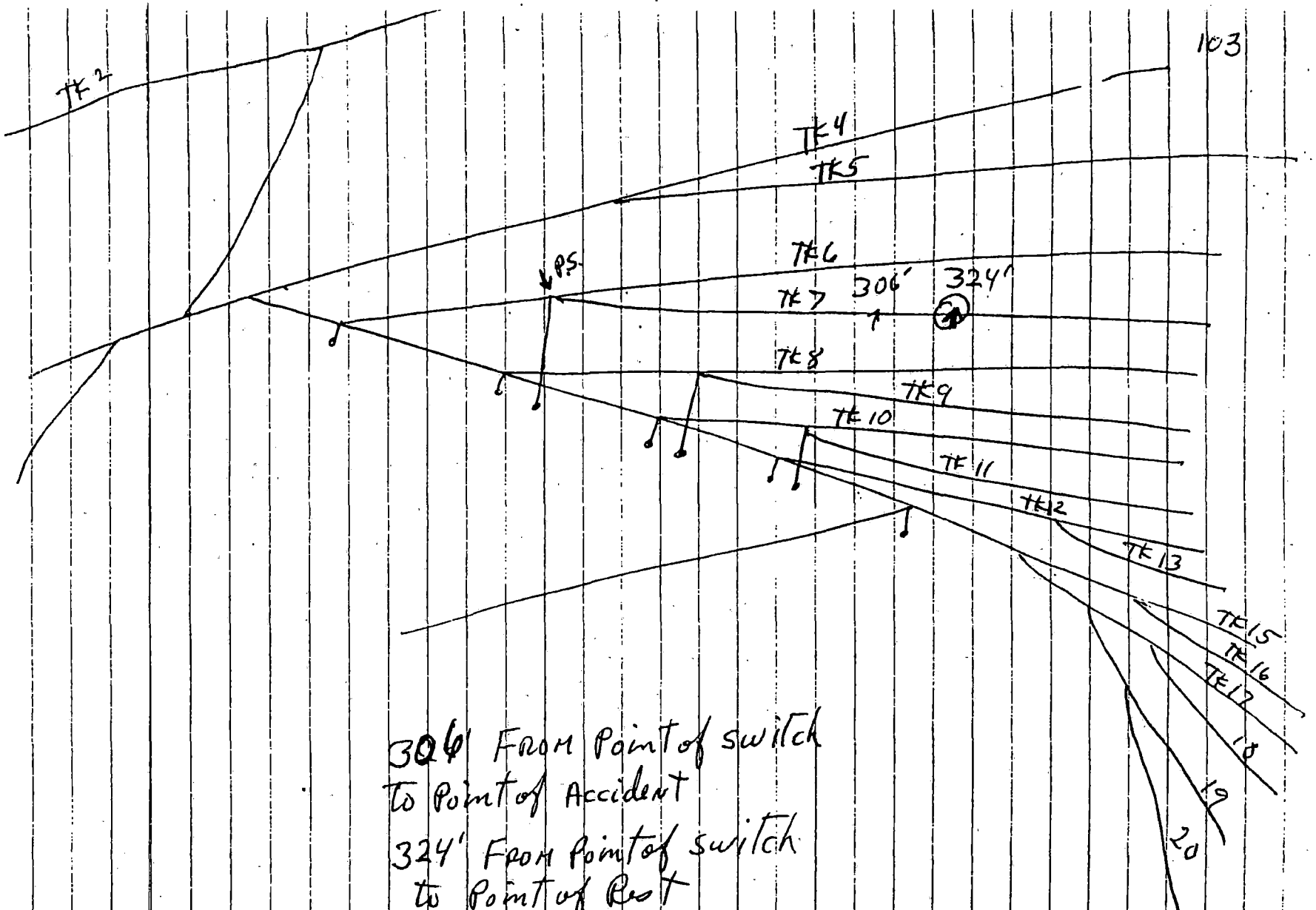
YARD

OFFICE



G = GLOVE — 141" FROM REST - laying AGAINST NR.
Ⓖ = GLASSES — 151" FROM REST - 14" from BASE of NR EDGE of TIE
R = RADIO — 159" FROM REST - 29" from BASE of NR
E = EYE LENSE - 217" FROM REST - 5" FROM BASE of NR

2/3/97



306' From Point of switch
To Point of Accident
324' From Point of switch
to Point of Rest

BURNS HARBOR YARD
CSS
BURNS HARBOR YARD
(BURNS HARBOR)

REPORT: FE-07-97

RAILROAD: Burlington Northern and Santa Fe Railway Company (BNSF)

LOCATION: Beatrice, Nebraska

DATE/TIME: Feb. 12, 1997 - 10:35 p.m., CST

PROBABLE CAUSE:

The Relief Conductor, standing to the rear of the Crew van during a Crew change, was struck by a pickup truck operated by an individual driving under the influence.

EMPLOYEE:

Craft	**Transportation**
Activity	Crew Change
Occupation	Conductor
Age	56 years
Length of Service	27 years
Last Rules Training	Jan. 21-22, 1997
Last Safety Training	Jan. 21-22, 1997
Last Physical Exam	Feb. 25, 1994

Circumstances Prior to the Accident

On Feb. 12, 1997, a train Crew comprising an Engineer, Conductor, Brakeman, and Student Brakeman reported for duty at 11 a.m. (CST) in Lincoln, Nebraska, to operate Train 25645-12 from Lincoln to Wymore, Nebraska, on the Nebraska Division, Beatrice Subdivision. All members of the Crew had received the required off-duty time prior to going on duty.

The Crew Members went on duty at 11 a.m. and received their normal paperwork, including work orders. The work orders the Crew Members received had the wrong locomotive number, and the work orders had to be changed. They went through the waybills and checked for hazardous material cars, and what had to be done. They also checked the latest bulletins. The Crew was then bussed to the train in the north yard.

Upon arrival at the train, the Conductor noticed an anhydrous ammonia car next to the locomotive and contacted the Humpmaster. The Humpmaster stated it was not a placarded car.

Therefore, the Crew could depart. The Conductor walked back and looked at the tank car and discovered it was placarded. The Conductor then notified the Yardmaster that a placarded tank car was first behind the locomotive and would have to be switched out and buried. Approximately 45 minutes later, the Yardmaster notified the Crew to cut the locomotives off and pick up some cars on North Yard 7, and that would provide cover for the anhydrous ammonia tank car. While the Crew Members were performing this operation, their train consist became blocked by Train No. 110 for some time. The Crew was then informed there was a car mistakenly placed in the consist that would have to be set out on another track.

The Crew finally departed Lincoln westbound at 6:40 p.m. (CST). The rest of the trip was uneventful. The Conductor informed the Fort Worth Dispatch Center that they would be unable to complete the switching at Hoag and would need to be relieved. At approximately 9:45 p.m. (CST), the Relief Crew Members informed the Conductor on Train 25645-12 that they would be at Hoag at 10:30 p.m. (CST) to relieve them.

When the train arrived at Hoag, the Conductor was in the caboose at the rear of the train. The Engineer pulled the rear of the train to the crossing for the Conductor to unload his grip. The Engineer then backed the train up and stopped clear of DOT Crossing No. 0641128 at approximately 10-20 feet to wait for the Relief Crew. The locomotive was facing southeast, and the headlight was illuminated.

DOT Crossing No. 0641128 was a 28-foot wide gravel county road with one mainline track across the crossing. Two fertilizer plants, located in the immediate area, precipitated a lot of truck traffic. The crossing was wide open, with a 1 to 1 ½ mile visibility in either direction, and equipped with only crossbucks as warning devices. The county road ran east/west, and the tracks ran north/south at about an 80-degree angle to the road.

At approximately 10:35 p.m. (CST), the Crew van owned and operated by Gary W. Trump, doing business for DMN Hotel in Wymore, Nebraska, pulled up to the crossing and stopped on the east side. The van then pulled across the crossing and stopped on the west side, off to the side of the road as far as the driver could get, so the Crew could unload without having to get in the graded ditch. The van had on its emergency flashers. The Relief Engineer was sitting in the front passenger seat, and the Relief Conductor and Relief Brakeman sat in two captain chairs behind the front seats.

The Relief Conductor and Relief Brakeman were the first to exit the van and get their grips. The Relief Brakeman took his grip and set it on the ground on the east side of the rails. The Relief Engineer then got out of the van and retrieved his grip from the back seat. He then went up to where the Relief Conductor and Relief Brakeman were standing behind the van. He then walked to the north and boarded the locomotive on the west side, and stood on the front of the locomotive waiting for the relieved Engineer to exit.

The relieved Conductor, Brakeman, and Student Brakeman, who had already exited the locomotive and had placed their grips in the back of the van, were talking to the Relief Conductor and Relief Brakeman behind the van. The other Brakeman then stepped over to the west side of the locomotive and down in the graded ditch. The Student Brakeman was putting his grip in the back of the van. The van doors were open, obscuring the flashing lights from the rear.

It was a clear, dark night with a temperature of 14° F.

The Accident

A gas company van passed by, heading east. A few seconds later, a pickup truck heading west approached and struck the Relief Conductor and Student Brakeman, pinning them between the front of the pickup truck and the rear of the Crew van. The impact shoved the Crew van forward.

The Gage County Sheriff's Office was notified at 10:39 p.m. (CST), and the Sheriff and a Deputy arrived on the scene at 10:59 p.m. (CST). The Deputy Sheriff, serving as Acting County Coroner, pronounced the Relief Conductor dead at the scene. The Beatrice Fire Department was notified and at 10:41 p.m. (CST) dispatched one rescue unit, one ambulance, and one fire truck to the scene.

The Student Brakeman was transported to Lincoln General Hospital in Lincoln, Nebraska, where he was admitted with compound fractures in both legs. The Crew Van Driver was treated at Beatrice Community Hospital in Beatrice, Nebraska, for a cervical sprain and released. The injuries of the Driver of the pickup truck were unknown.

Please see the attached six diagrams of the accident scene, DOT Crossing No. 0641128, to better visualize the chain of events that led up to the fatality.

Post-Accident Investigation

FRA did not respond to the scene or inspect the accident site.

The Gage County Sheriff's Office was contacted, and a copy of their report was requested on Feb. 13, 1997. However, this report was not furnished to FRA. FRA received the Gage County Sheriff's Office report from the BNSF Claim Department in Lincoln, Nebraska.

The BNSF Nebraska Division Office in Lincoln provided the following:

- A listing of individuals involved, including the Crew Members, Van Driver, and Pickup Truck Driver;
- Track charts of the accident scene;
- A copy of the Fort Worth Network Operations Center Incident Report;

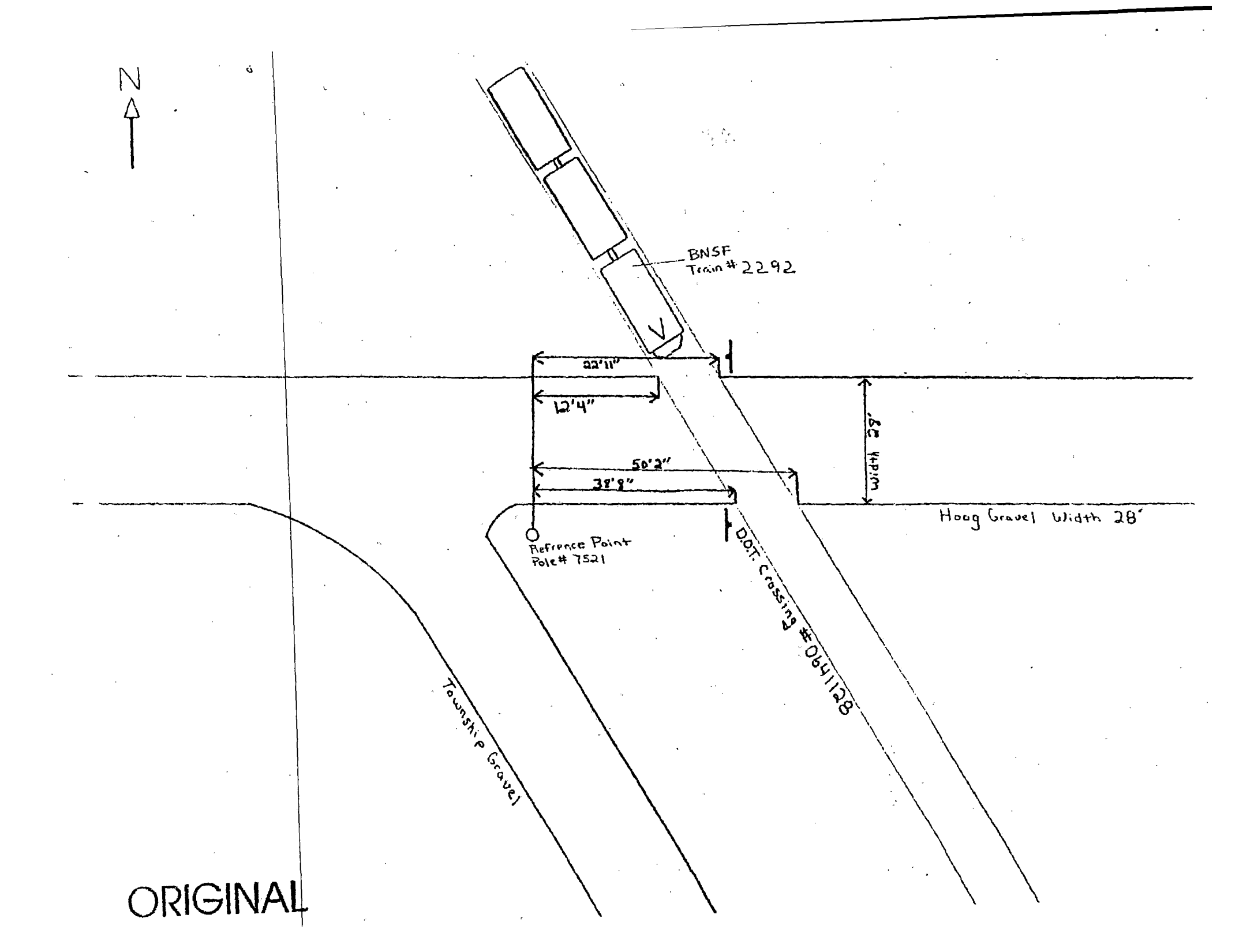
- Copies of the Employee Personnel Injury/Occupations Illness Reports for injured employees;
- A copy of the track warrant and track bulletins issued to Train No. 25645-12, and train lists for Train No. 25645-12 departing Lincoln, arriving Crete, departing Crete, arriving Hoag, and arriving Wymore; and
- A copy of the article from the Lincoln Journal Star dated Feb. 13, 1997.

The BNSF Network Operations Center in Fort Worth, Texas, was contacted and provided the Forms FRA F6180.55, F6180.55a, and F-27 Wire Notification Initial Report and Corrected Report.

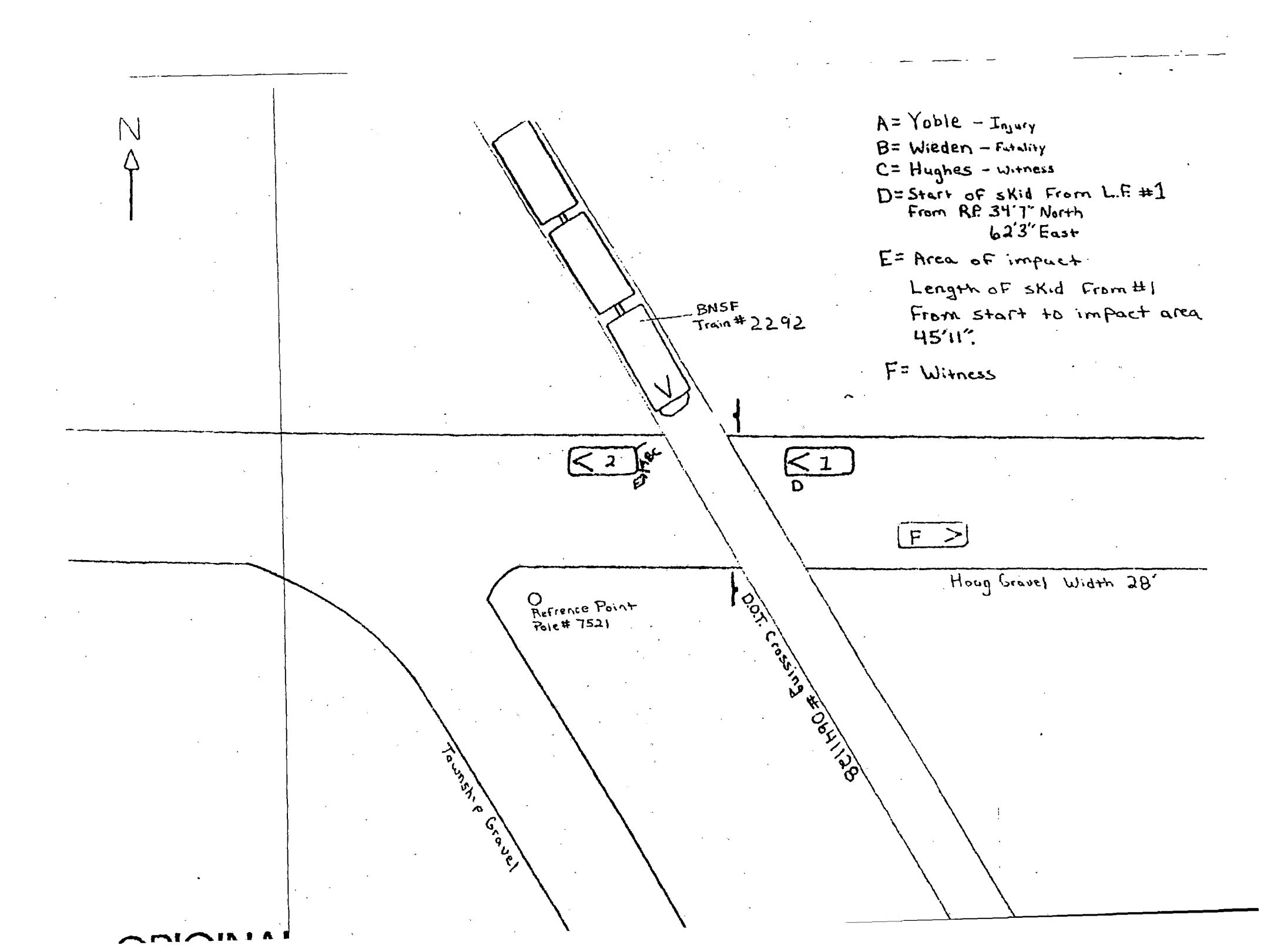
The Crew Members were contacted and interviewed. In addition, the Crew Van Driver was contacted and referred FRA to his attorney who declined the interview.

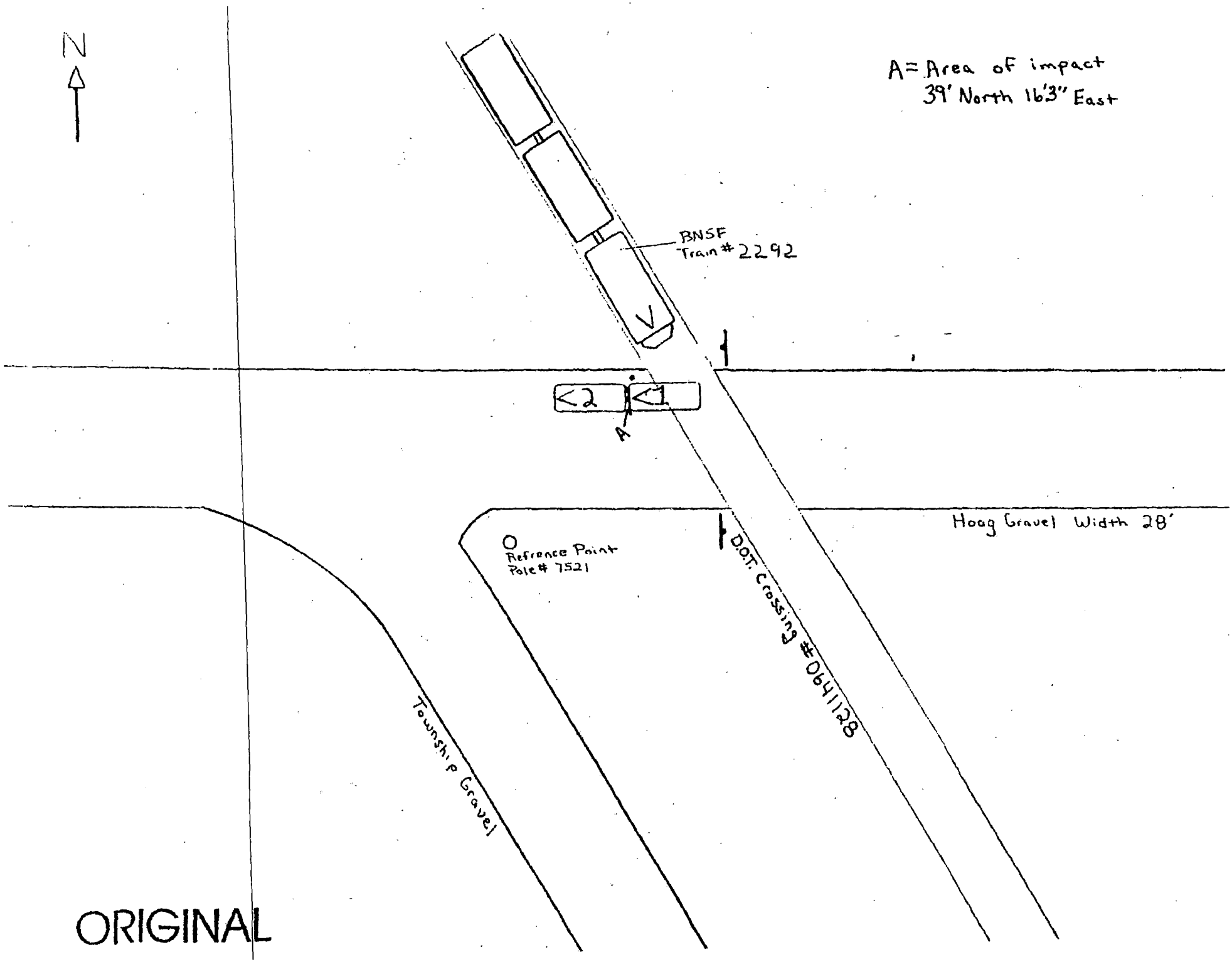
The Gage County Attorney was contacted and interviewed. In addition, copies of the report of the re-enactment of the accident and the coroner's report were requested. The County Attorney would not release either report without a subpoena. No reports were received from Gage County officials.

On Sept. 30, 1997, the Gage County Attorney's Office was again contacted. The secretary stated that the Driver of the pickup was charged with driving under the influence and on June 24, 1997, found guilty and sentenced to nine months probation and fined $200 and court costs.

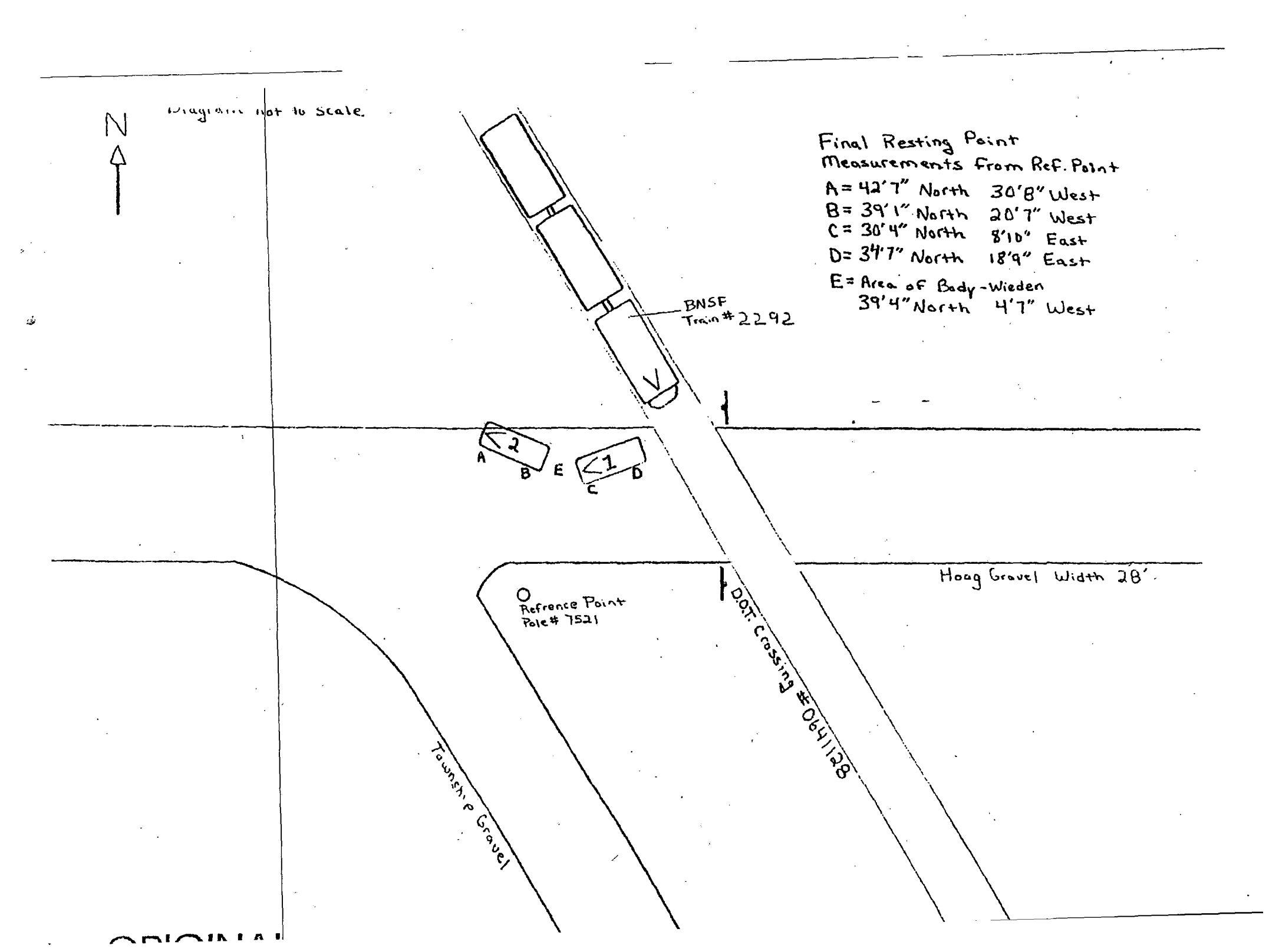

N
BNSF
Train # 2292
22'11"
12'4"
50'2"
38'8"
Width 28'
Hoag Gravel Width 28'
Refrence Point
Pole # 7521
D.O.T. Crossing # 064128
Township Gravel

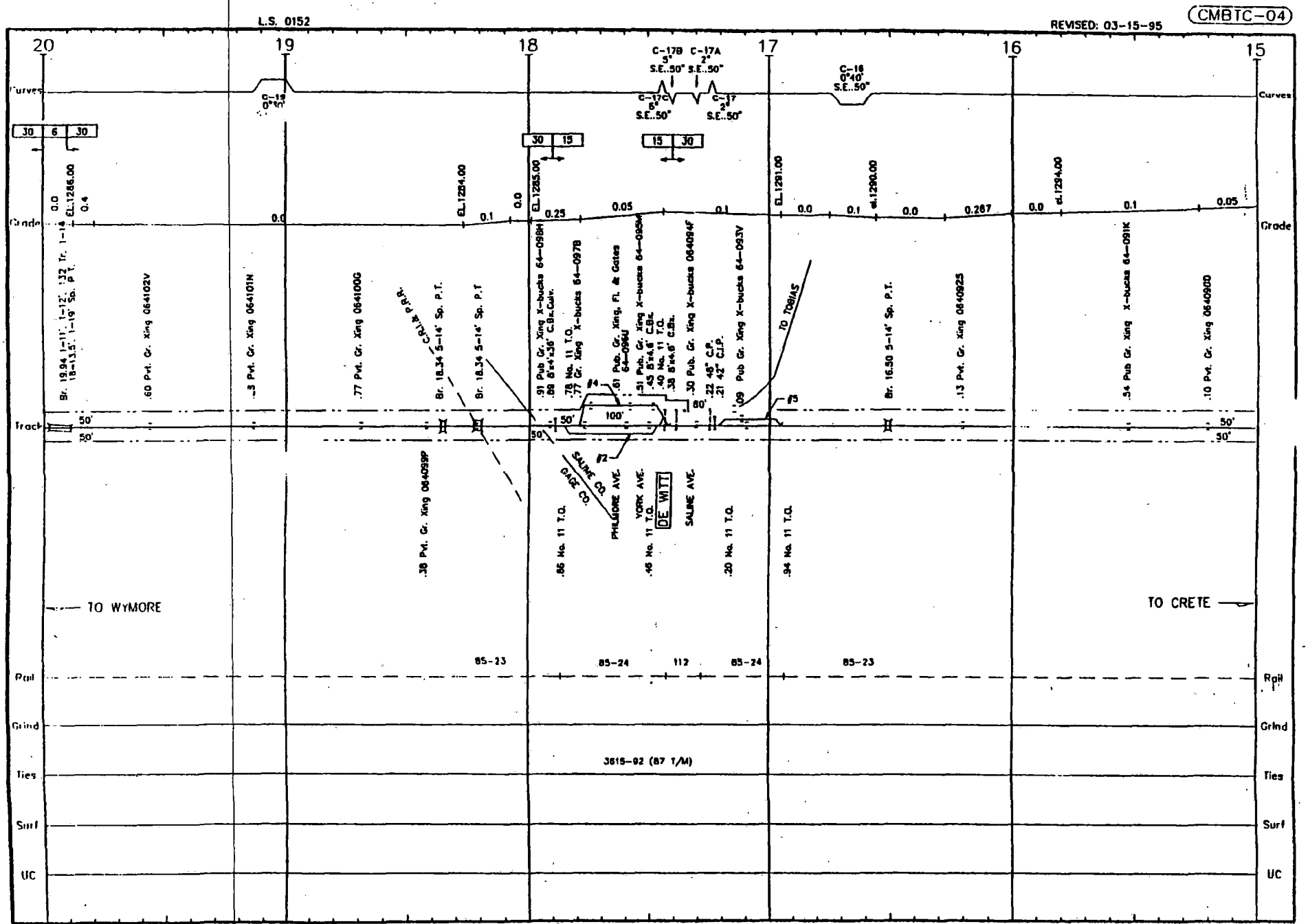
ORIGINAL

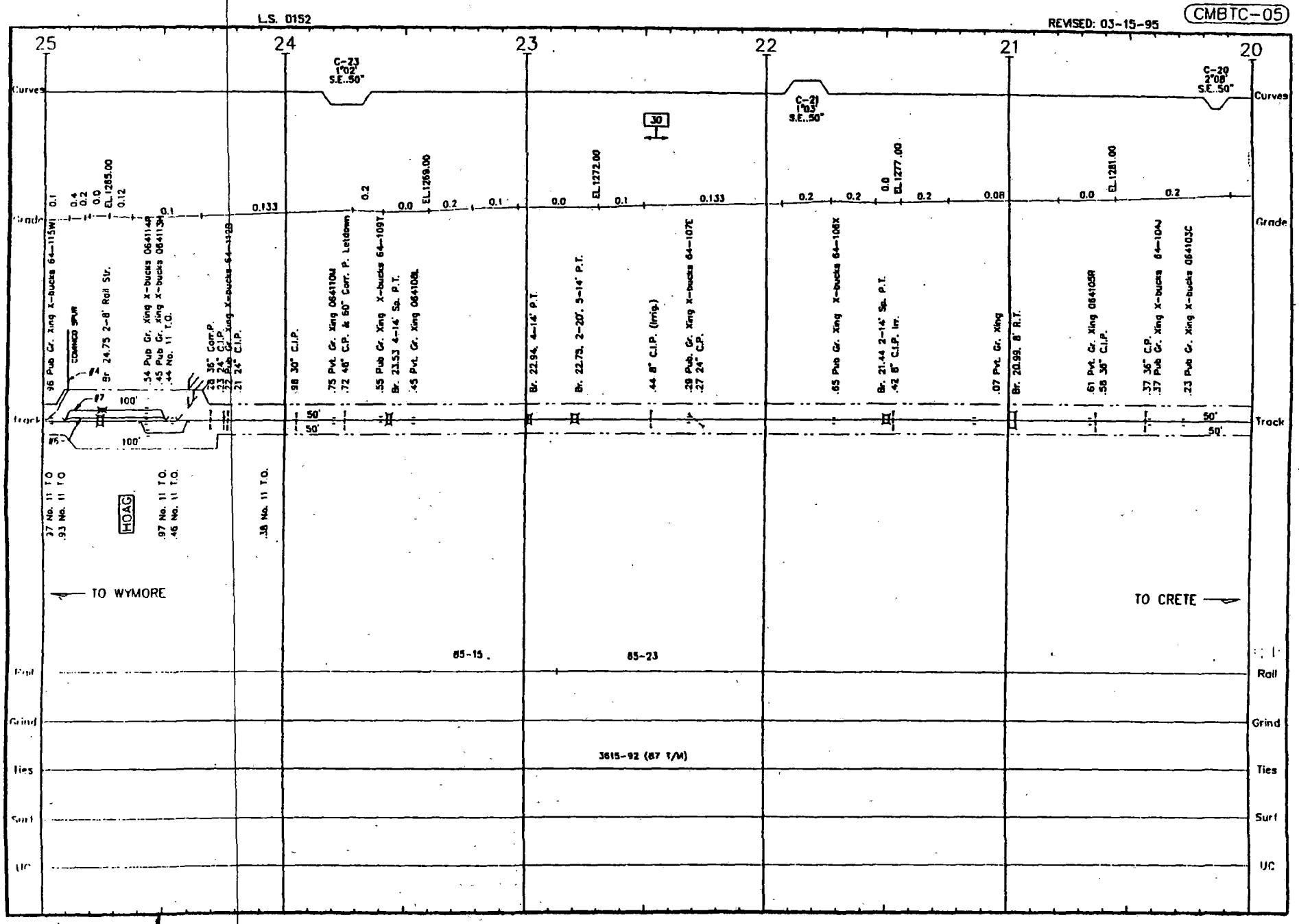

N
A= Yoble – Injury
B= Wieden – Futality
C= Hughes - Witness
D= Start of skid From L.F. #1
From RF 34'7" North
62'3" East
E= Area of impact
Length of skid From #1
From start to impact area
45'11".
F= Witness
BNSF
Train # 2292
V
< 2
Effec
< 1
D
F >
Hoog Gravel Width 28'
O
Refrence Point
Pole # 7521
D.O.T. Crossing #064112B
Township Gravel


N
A= Area of impact
39' North 16'3" East
BNSF
Train # 2292
V
1
<2
<1
A
Hoag Gravel Width 28'
Refrence Point
Pole # 7521
D.O.T. Crossing # 641128
Township Gravel

ORIGINAL


N
Diagram not to scale.
Final Resting Point
Measurements from Ref. Point
A = 42'7" North 30'8" West
B = 39'1" North 20'7" West
C = 30'4" North 8'10" East
D = 34'7" North 18'9" East
E = Area of Body - Wieden
39'4" North 4'7" West
BNSF
Train # 2292
V
1
2
A
B
E
1
C
D
Hoag Gravel Width 28'
Refrence Point
Pole # 7521
D.O.T. Crossing # 064112B
Township Gravel


L.S. 0152
REVISED: 03-15-95
CMBTC-04
20
19
18
17
16
15
Curves
Grade
Track
Rail
Grind
Ties
Surf
UC
C-19 0°30'
C-17B 3° S.E..50'
C-17A 2° S.E..50'
C-17C 6° S.E..50'
C-17 2° S.E..50'
C-16 0°40' S.E..50'
30 6 30
30 15
15 30
EL.1286.00
EL.1284.00
EL.1285.00
EL.1291.00
el.1290.00
el.1294.00
Br. 19.94 1-11'; 1-12'; 132 Tr. 1-16 18-13.5'; 1-19' Sp. P.T.
.60 Pvt. Gr. Xing 064102V
.3 Pvt. Gr. Xing 064101N
.77 Pvt. Gr. Xing 064100G
Crane P.R.R.
Br. 18.34 5-14' Sp. P.T.
Br. 18.34 5-14' Sp. P.T
.91 Pub. Gr. Xing X-bucks 64-098H
.88 8'x4'x36' C.Bx.Culv.
.78 No. 11 T.O.
.77 Gr. Xing X-bucks 64-097B
.61 Pub. Gr. Xing, Fl. & Gates 64-096U
.51 Pub. Gr. Xing X-bucks 64-095K
.45 8'x4.6' C.Bx.
.40 No. 11 T.O.
.38 8'x4.6' C.Bx.
.30 Pub. Gr. Xing X-bucks 0640946
.22 45° C.P.
.21 42" C.I.P.
.09 Pub Gr. Xing X-bucks 64-093V
To TOBIAS
Br. 16.50 5-14' Sp. P.T.
.13 Pvt. Gr. Xing 0640925
.54 Pub Gr. Xing X-bucks 64-091K
.10 Pvt. Gr. Xing 0640900
#4
#5
#2
100'
80'
50'
SALINE CO. GAGE CO.
PHILGORE AVE.
YORK AVE.
DE WITT
SALINE AVE.
.39 Pvt. Gr. Xing 0640999P
.85 No. 11 T.O.
.46 No. 11 T.O.
.20 No. 11 T.O.
.34 No. 11 T.O.
TO WYMORE
TO CRETE
85-23
85-24
112
85-24
85-23
3615-92 (87 T/M)


L.S. 0152
REVISED: 03-15-95
CMBTC-05
25
24
23
22
21
20
C-23 1°02 S.E..50"
C-21 1°03 S.E..50"
C-20 2°08 S.E..50"
Curves
Grade
Track
Rail
Grind
Ties
Surf
U/C
EL.1265.00
EL.1269.00
EL.1272.00
EL.1277.00
EL.1281.00
.96 Pub Gr. Xing X-bucks 64-115W
Br. 24.75 2-8' Rail Str.
.54 Pub Gr. Xing X-bucks 0641148
.45 Pub Gr. Xing X-bucks 0641134
.44 No. 11 T.O.
.28 36" Corr.P.
.22 24" C.I.P.
.21 24" C.I.P.
.98 30" C.I.P.
.75 Pvt. Gr. Xing 0641104
.72 48" C.I.P. & 60" Corr. P. Letdown
.55 Pub Gr. Xing X-bucks 64-109T
Br. 23.53 4-14' Sa. P.T.
.45 Pvt. Gr. Xing 0641084
Br. 22.94, 4-14' P.T.
Br. 22.73, 2-20', 3-14' P.T.
.44 8" C.I.P. (Irrig.)
.28 Pub. Gr. Xing X-bucks 64-107E
.27 24" C.P.
.65 Pub Gr. Xing X-bucks 64-108X
Br. 21.44 2-14' Sa. P.T.
.42 8" C.I.P. Irr.
.07 Pvt. Gr. Xing
Br. 20.99, 8' R.T.
.61 Pvt. Gr. Xing 0641058
.58 36" C.I.P.
.37 36" C.P.
.37 Pub Gr. Xing X-bucks 64-104J
.23 Pub Gr. Xing X-bucks 0641036
.37 No. 11 T.O.
.93 No. 11 T.O.
.97 No. 11 T.O.
.46 No. 11 T.O.
.38 No. 11 T.O.
#4
#7
#6
100'
50'
COMMCO SPUR
HOAG
TO WYMORE
TO CRETE
85-15
85-23
3615-92 (67 T/M)

REPORT: FE-09-97

RAILROAD: Soo Line Railroad (SOO)

LOCATION: St. Paul, Minnesota

DATE, TIME: Feb. 3, 1997, 11:25 a.m., CST

PROBABLE CAUSE:

The Track Gang employees did not comply with the provisions of the carrier's on-track safety rules and procedures manual.

EMPLOYEE: **Craft.....Maintenance of Way**

Activity.....Cleaning and salting switches.

Occupation..... Track Laborer

Age..... 37 years

Length of Service.....Six years

Last Rules Training..... June 14, 1994

Last Safety Training.....June 24, 1996

Last Physical Examination..... .....May 4, 1993

The Track Laborer reported to work with the St. Paul Section on Feb. 3, 1997 at 7 a.m. He began working with the Assistant Foreman, a Truck Driver, and another Trackman, who were cleaning and salting switches. They loaded salt on the back of the boom truck and began working at the east roundhouse turnouts, working to the east toward the yard office. The Truck Driver was acting as a Lookout and was to sound the truck horn when a train approached.

Switch Crew 4705, comprising an Engineer, Conductor, and Brakeman, went to work on Feb. 3, 1997 at 7 a.m. This Crew serviced industries in and around St. Paul, Minnesota. Crew Members began preparing their train by switching on the Swamp tracks. Normally their train was prepared for them and ready on the Swamp tracks. However, on Feb. 3, 1997, and the previous four days, the Train Crew Members had to make up their own train by pulling cars from the Bowl tracks through the 32 Crossover to the Swamp tracks. The 32 Crossover Turnout on Track 41 was lined to the 32 Crossover.

The accident occurred at the 32 Crossover Turnout on Track No. 41 in the St. Paul Yard, St. Paul, Minnesota. Track No. 41 was part of the "Swamp" section of St. Paul Yard, located

south of the yard office. Track No. 41 extended east to west and was adjacent to the yard office. The 32 Crossover Turnout on Track No. 41 was also adjacent to the yard office. The 32 Crossover extended generally southwest to northeast and connected Track No. 41 to the Bowl tracks north of the yard office. Track No. 41 curved to the south with a 4-degree curve about 200 feet west of the 32 Crossover Turnout. Track No. 42 was located south of Track No. 41. The west end of Track No. 42 converged onto Track No. 41 about 450 feet west of the 32 Crossover Turnout. Track No. 41 descended slightly from the west end to the center and then rose slightly to the east end. A series of crossover turnouts known as the "top end" were on the Swamp tracks approximately 400 to 800 feet west of the yard office.

The Bowl tracks were north of the yard office. They extended from the hump westward to the yard office. The Bowl tracks terminated on the west end onto the north and south lead tracks.

The yard office consisted of a brick building with several temporary mobile structures located immediately to the west. A parking lot was south of the yard office across four Swamp tracks. The parking lot surface was about three feet below the tracks.

When the Track Crew began working at the "top end" switches, they had to wait about 30 minutes while Switch Crew 4705 was operating over the switches. Switch Crew 4705 shoved its cut eastward onto the Bowl tracks across the Divide Turnout onto the south Lead. They left a cut of cars on Track No. 41 and on the 32 Crossover. The Track Crew finished cleaning and salting the "top end" switches, and then began working on the switches on the south lead at the west end of the Bowl tracks.

The Track Laborer was working with another Trackman at Switch No. 26, located on the south lead just north of the yard office. The Assistant Foreman was working at the Divide Switch about 100 feet west of Switch No. 26, and the Truck Driver was the Lookout from the truck. The Track Laborer left Switch No. 26 without notifying the Lookout or the other Trackman, walked between the temporary yard office buildings to the 32 Crossover Turnout, and began salting the switch.

Switch Crew 4705 had gone back to the "top end" on the south Lead through the Divide Turnout from the Bowl tracks. The Crew Members had to cut a car out of their train for Track No. 41. They set a light hand brake on AMGX 613200 (an open-top, hopper car), pulling the remainder of the cut out of Track No. 41. AMGX 613200 was sitting by itself on Track No. 41 with its west end approximately 10 feet east of the 32 Crossover Switch points. Switch Crew 4705 pulled the rest of its cut clear of Track No. 42 and kicked one car onto Track No. 42. The car came to rest just in the clear. The Crew then pulled clear of Track No. 42 and let two cars roll slowly onto Track No. 41 toward the standing car. One ground member of the Crew was at the 41/42 switch, and the other was at the southwest corner of the car switched onto Track No. 42.

The Accident

The Track Laborer began salting the 32 Crossover Switch by standing on the north side looking south. He then crossed into the center of the track facing east and continued salting the track. He was carrying a 50-pound bag of salt.

Flatcars Nos. TTJX 81978 and TTJX 82001, which were loaded with steel reinforcing bars, were rolling east onto Track No. 41 when they struck the Track Laborer. The moving cars carried him until they struck AMGX 613200. The cars did not couple. Upon impact, AMGX 613200 was shoved about two car lengths where it came to rest. The two TTJX cars rolled back to the west about half a car length. The Track Laborer was lying at the west end of AMGX 613200 across the south rail.

A non-railroad employee sitting in a transport van viewed the accident from a parking lot located south of the Swamp tracks. He flagged a member of Switch Crew 4705 and ran across the Swamp tracks to reach the Track Laborer. Emergency personnel were summoned along with St. Paul Police. The Track Laborer was transported to St. Paul - Ramsey Medical Center where he underwent surgery. He succumbed to his injuries and was pronounced dead on Feb. 13, 1997.

Please see the attached diagram of the St. Paul yard, to better visualize the accident scene and the chain of events that led to the fatality.

Post-Accident Investigation

Preliminary information was compiled following the occurrence, and an investigation was initiated upon notification of the Track Laborer's death. The Soo Line Claims Department supplied copies of interviews conducted by the railroad immediately after the accident had occurred. Additional interviews were conducted with track personnel to supplement the railroad's information. Photographs of the accident scene were provided by Soo Line and the St. Paul Police Department.

Staff at the Ramsey Medical Center in St. Paul performed a drug and alcohol test on the Track Laborer on Feb. 3, 1997. Results of the test were negative.

The Soo Line's ON-TRACK SAFETY RULES AND PROCEDURES MANUAL became effective Aug. 1, 1996. These rules required that all Roadway Workers receive training at least once every year. Lookouts, Flagmen, Lone Workers, and Machine Operators must be qualified on the rules specific to their positions at least once every year. The Track Laborer received training and was qualified on the On-Track Safety Rules on June 24, 1996. His last hearing exam was held Aug. 5, 1996, with no problems noted. He had worked continuously in the St. Paul Yard since March 7, 1994, with only one furlough period. Although the entire Work Gang was responsible for adhering to the provisions of the On-Track Safety Rules and

Procedures Manual, neither the Watchman/Lookout nor the Track Laborer complied with the designated procedures as outlined in the manual (see Page 4 for Applicable Rules).

Examination of the various positions of the Track Laborer and Switch Crew 4705 were made. The Switch Crew could be seen from Switch No. 26 where the Track Laborer was working prior to walking to the 32 Crossover. When the Track Laborer walked between the temporary buildings, his view of the Switch Crew ground personnel may have been blocked by the standing car on Track No. 42. He then turned and walked to the east toward the 32 Crossover, with his back toward the Switch Crew, and was subsequently struck by the rolling cut of cars.

The following summarizes the railroads's operating rules which were not followed:

SOO Line's On-Track Safety Rules and Procedures
Applicable Rules

Rule 21.3 - Lookouts:

> When visibility is limited by weather or for any other reason, other forms of on-track safety procedures should be used.

Rule 21.4 - Lone Worker

> A Lone Worker may perform routine inspection or minor work when: the Lone Worker is able to visually detect the approach of a train at the maximum authorized timetable speed and be in a place of safety 15 seconds before the arrival of a train.

Rule 21.5 - Individual Train Detection

> A Lone Worker using individual train detection must complete a Statement of On-Track Safety as outlined under Rule 21.6 prior to occupying or fouling a track.

Rule 21.6 - Statement of On-Track Safety

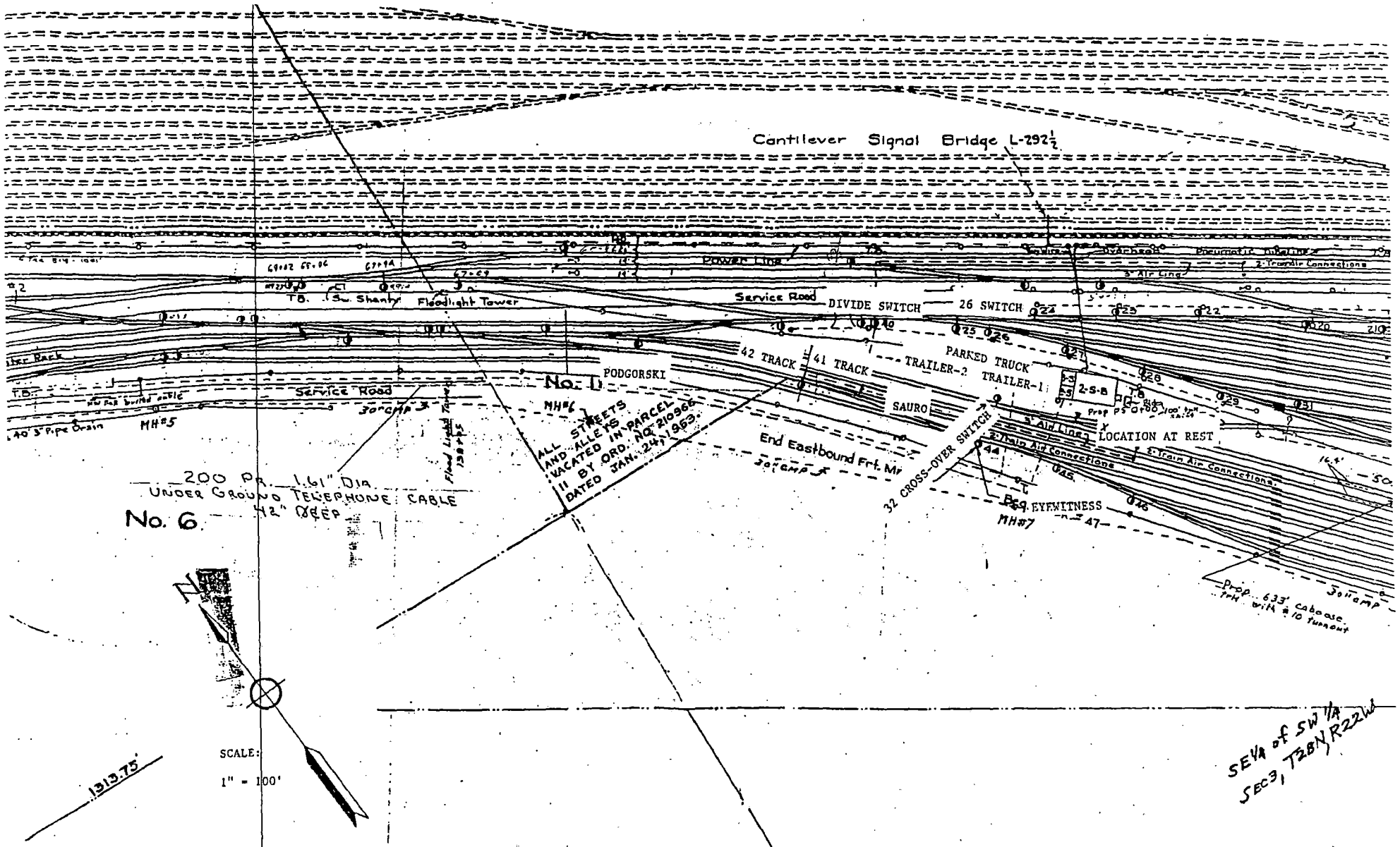
> A Lone Worker using Individual Train Detection must complete this form prior to fouling a track. The On-Track Safety form must be in the employee's possession when in effect.

Rule 29.5 - Responsibilities of Lookouts

> Lookouts are responsible for devoting their full attention to detecting the approach of trains and providing warning to employees.

Rule 29.6 - Responsibilities of Lone Workers

A Lone Worker is responsible for conducting a job briefing with his/her Supervisor or other designated employee. This briefing should include a planned itinerary, and on-track protection procedure to be used.


Cantilever Signal Bridge L-292½
Power Line
Service Road
DIVIDE SWITCH
26 SWITCH
Floodlight Tower
T.B. Sw. Shanty
42 TRACK
41 TRACK
PARKED TRUCK
TRAILER-2
TRAILER-1
PODGORSKI
SAURO
2-S-8
No. 1
MH#6
MH#5
Service Road
End Eastbound Frt. Mn
32 CROSS-OVER SWITCH
LOCATION AT REST
EYEWITNESS
MH#7
ALL STREETS AND ALLEYS VACATED IN PARCEL II BY ORD. NO. 210966 DATED JAN. 24, 1963.
200 PR. 1.61" Dia. UNDER GROUND TELEPHONE CABLE 42" DEEP
No. 6
Prop. 633' Caboose Trk with #10 Turnout
1313.75'
SCALE:
1" = 100'
SE¼ of SW¼ Sec 3, T28N R22W

REPORT: FE-10-97

RAILROAD: Consolidated Rail Corporation (CR)

LOCATION: Newark, New Jersey

DATE, TIME: March 21, 1997, 7:15 p.m., EST

PROBABLE CAUSE:

The Carman failed to maintain proper vigilance for moving railroad equipment while fouling unprotected track.

POSSIBLE CONTRIBUTING FACTOR:

Lack of communication between the Carman, the Yardmaster, and Train Crew Members.

EMPLOYEE:	**Craft**	**Maintenance of Equipment**
	Activity	Inspection of 72 cars for outbound train and switching at the same time.
	Occupation	Car Inspector (Carman)
	Age	55 years
	Length of Service	Two years, nine months
	Last Rules Training	March 20, 1997
	Last Safety Training	March 21, 1997
	Last Physical Exam	March 11, 1997

Circumstances Prior to the Accident

At 3 p.m., on Friday, March 21, 1997, a Conrail (CR) employee (deceased) reported for his regularly assigned duties as a Car Inspector (Carman) on the 3 p.m. to 11 p.m. shift at the railroad's Oak Island Yard in Newark, New Jersey. The Carman had returned to work the previous day (Thursday, March 20) following an extended absence from work due to an on-the-job shoulder injury he had sustained on July 17, 1995. Including this extended absence from work, his total experience with CR was two years, nine months. The Car Inspector had previously been employed as a Brakeman by the New Jersey Transit Rail Operations (passenger

trains only) from Jan. 10, 1994 through Sept. 16, 1994. Following a routine job briefing conducted by the Carman's Supervisor (Foreman), he began his normal work activities.

At approximately 6:30 p.m., the Carman and a co-worker were assigned to inspect 72 cars for outbound Train OIAL-7, located on Track No. 7 in the receiving yard. The receiving yard was a clear, open area with tracks running in an east/west timetable direction. There was an access road parallel to Track No. 7 to the south side and an adjacent track (Track No. 8) to the north. As instructed, the two Carmen proceeded to the receiving yard by truck and, after applying Blue Signal protection to both ends of Track No. 7, began walking the cars from opposite ends of the track and on opposite sides of the cars. The Carman began walking eastbound between Tracks Nos. 7 and 8 while his co-worker walked westbound along the access road. At approximately the mid-way point of the 72-car train, the two Carmen met one another and, following a brief conversation, continued their inspection. At some point after the two Carmen resumed their inspection, the co-worker heard a locomotive pass his location traveling eastward on Track No. 8.

On the day of the accident, the Crew for Switch Job YPOI-31 at Conrail's Oak Island Yard reported for duty at 3:45 p.m. The Crew comprised an Engineer, Conductor, and Brakeman. At approximately 6:45 p.m., the Switch Crew received instructions from the Yardmaster to couple onto four cars located near the west end of Track No. 8 and shove them to a coupling with a tank car located near the east end of the track. The Conductor proceeded on foot to the east end of Track No. 8 to position himself at the tank car, while the Brakeman stayed with the locomotive to couple the four cars at the west end of the track. After coupling to the four cars and releasing the handbrakes, the Brakeman returned to the locomotive and positioned himself in the Fireman's seat opposite the Engineer (south side). The Engineer contacted the Conductor by radio and informed him that they were shoving the four cars eastward toward him. The locomotive headlight was on dim, and the bell was ringing. The shoving movement was made at an estimated speed of between 5 and 10 mph.

The weather at the time of the accident was clear and cold with a temperature of 40° F. It was dark at the time of the accident (7:15 p.m.). There was no artificial lighting in the area.

The Accident

There were no eye-witnesses to the accident. Upon reaching the west end of the 72 cars on Track No. 7, the co-worker attempted several times to contact the Carman by radio. Receiving no answer, he began walking eastward toward the opposite end of the track in search of the Carman. At some point, he radioed the Foreman to inform him of the missing employee. The Foreman notified the Yardmaster to stop all train movements in the yard, and he and another Carman proceeded to the receiving yard to assist in the search.

At approximately 8:00 p.m., the Carman was found fatally injured lying between Tracks Nos. 7 and 8. Evidence indicates that the Carman was struck in the back and left shoulder by the

moving equipment traveling east on Track No. 8. His right arm was severed above the elbow by the wheels of the passing equipment. While awaiting the arrival of the emergency responders from University Hospital in Newark, NJ, the Foreman performed CPR to no avail. The Carman was pronounced dead at 8:54 p.m., and the body was removed from the scene at 11:38 p.m.

Please see the attached diagram of the Oak Island Yard to better visualize the accident scene and the chain of events that led up to the fatality.

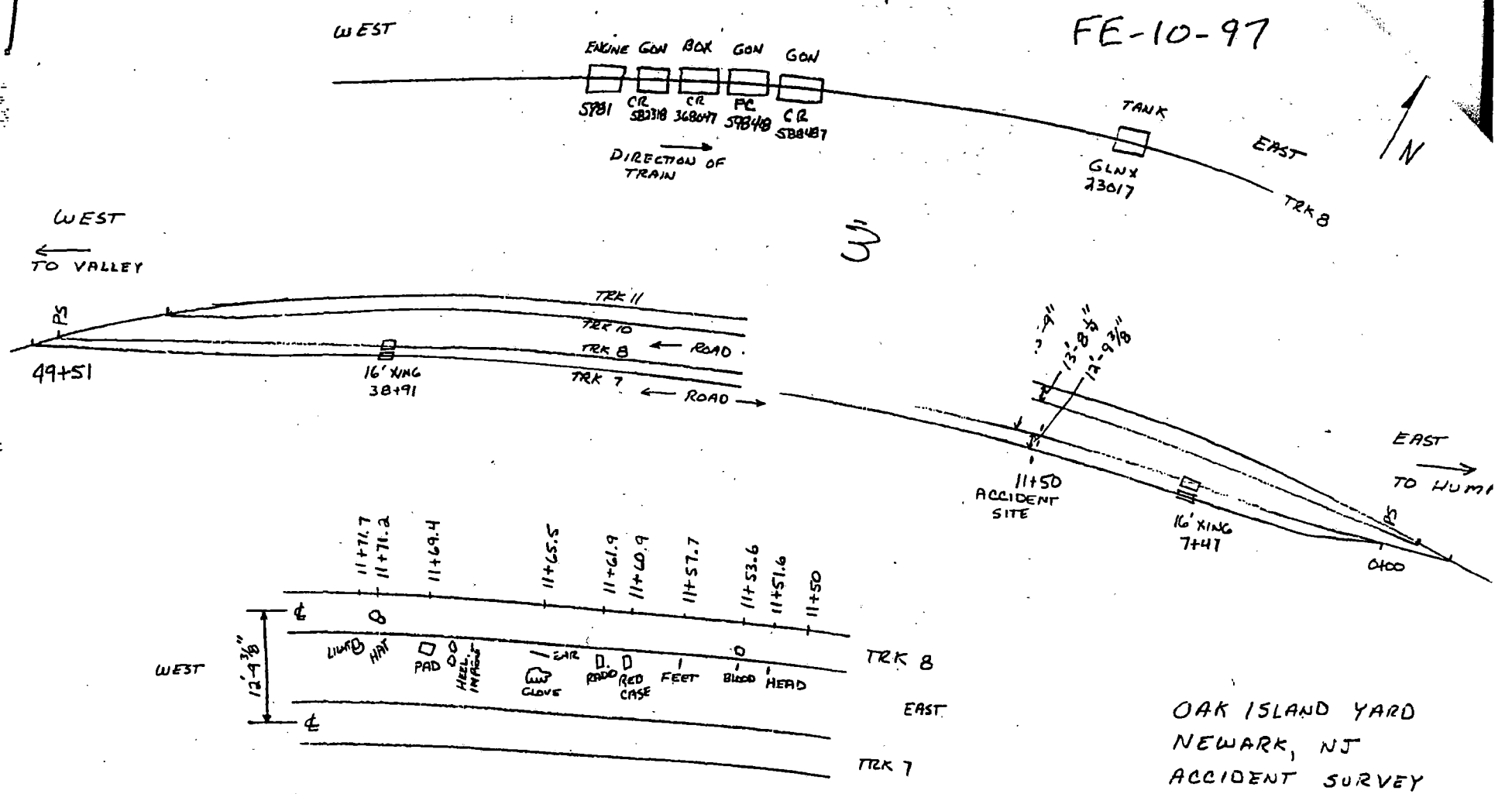
Post-Accident Investigation

Federal Railroad Administration (FRA) investigators inspected the equipment involved and found no defective conditions that would have contributed to the cause of the accident. There were no lading or other protruding parts of the cars which could have struck the deceased. No exceptions were taken to the condition of the locomotive. A re-enactment of the shoving movement was conducted the following day to determine at what point an individual located on the ground between Tracks Nos. 7 and 8 could be seen from the locomotive cab. Due to the right-hand curvature of Tracks Nos. 7 and 8, the end of the leading car could not be seen from either side of the locomotive cab during the backward shoving move.

Post-accident interviews revealed that the Engineer and the Brakeman were unaware that the equipment had struck the Carman. The Conductor, who was positioned at the west end of the tank car awaiting the arrival of the shoving movement, did not see the accident either.

The New Jersey State Toxicology Laboratory at the Edwin H. Albano Institute of Forensic Science performed post-accident blood and urine toxicology tests. The test results were negative. Post-accident toxicology testing was also performed under FRA authority by northwest Toxicology Inc. at Salt Lake City, Utah. The results of those tests were also negative. The New Jersey State Medical Examiner's autopsy report indicated the cause of death was "multiple blunt force injuries."

FE-10-97



ACCIDENT SITE DETAIL

0+00 - DISTANCE IN FEET

℄ - CENTER LINE

OAK ISLAND YARD
NEWARK, NJ
ACCIDENT SURVEY
TRK 8 RECEIVING YARD
3-21-97 EXC

REPORT: FE -15-97

RAILROAD: Long Island Railroad (LIRR)

LOCATION: Nassau, New York

DATE, TIME: June 5, 1997, 10:40 a.m., EST

PROBABLE CAUSE:

The High-Tension Lineman lost contact with the tower while ascending for reasons unknown and fell to the ground.

EMPLOYEE:

Craft:..... Maintenance of Way

Activity..... Removal and installation of line boots (electrical connections) and hose to the Long Island signal lines.

Occupation..... High-Tension, Lineman-Apprentice

Age..... 28 years

Length of Service..... Two years

Last Safety Training..... Daily

Last Physical Exam..... July 25, 1996

Circumstances Prior to the Incident

On June 5, 1997, a High-Tension, Apprentice-Lineman reported for duty at 8:00 a.m. at his Floral Park headquarters. His headquarters were approximately 20 minutes from the Rockville Center. His Foreman noted nothing unusual about the Lineman. On the day of the accident, the Lineman was part of a 4-man Crew headquartered in Floral Park, and his assigned shift was 8:00 a.m. to 4:00 p.m. His Crew was involved with the removal and installation of line boots (electrical connections) and hose to the LIRR signal lines to facilitate the Long Island Lighting Company's (LILCO) work on their lines located above. Tower 12 was approximately 87 feet high and supported five cross arms. The lowest cross arm carried the LIRR's signal cables. This cross arm was 53 feet above the ground. There were four additional cross arms on the tower, which was owned and operated by LILCO. The tower was constructed of a steel box lattice system with four corners, whose width narrowed upward from the base. Four perpendicular supports held barbed wire around the tower on a horizontal plane, approximately 18 feet from the base. The tower had no climbing assists attached to it. The steel members were moderately

rusty, a preferred state for free climbing, as it enabled a better grip. The Lineman had climbed Tower 11 prior to his work on Tower 12.

The accident occurred in daylight with mostly clear skies and an estimated temperature of 55° F. The humidity was 74 percent with a dew point of 48° F. Winds were reported to be from the southwest with speeds of five mph or less.

The Accident

The Lineman and the Crew with whom he was working moved to Tower No. 12 and prepared to install the line hose and line hoods. The Lineman prepared himself and adjusted his belt and hand line with the help of a second Lineman. The second Lineman watched the Lineman ascend the tower. The Lineman was "free climbing" the tower. He was not secured to the tower and was carrying the hand line up with him, which was attached to his belt. The second Lineman observed the Lineman climbing the northwest corner, favoring the north side. This position would have the Lineman facing primarily south. The second Lineman observed the Lineman climb past the barbed wire, at which point he focused his attention on the hand line to ensure it was free of entanglements. The second Lineman then looked down to prepare the hand line to continue the job. Two other railroad employees, a third Lineman and the Gang Foreman, also observed the Lineman ascend past the barbed wire. Both the third Lineman's and the Gang Foreman's observations ended after the Lineman passed the barbed wire. They were then involved with the collection and assembly of the line hoses at the base of the tower. The second Lineman observed the Lineman ascend to a point eight to 10 feet from the cross arm, which placed him approximately 44 feet from the ground.

The LIRR employees recalled hearing the hand line fall to the ground, immediately followed by a thud. A LILCO worker also recalled hearing a thud and turning around to see the Lineman on the ground. None of the four witnesses recalled any previous sounds of distress from the Lineman. A witness in the parking lot south of the elevated track structure, however, claimed that he heard a yell. He had been walking to his office on the south side of the tracks at the time. Upon hearing the yell, he turned around to see "something" falling by one of the electrical towers.

The Lineman landed north of the tower base. Hearing the thud, the second Lineman turned and saw the Lineman's body lying on the ground. He then checked the Lineman and discovered he was still breathing. He also checked for a pulse which he discovered, then lost. The witness in the parking lot came over and saw the Lineman bleeding heavily and returned to his office to summon help. He returned with a Company Medical Coordinator, who was also a Registered Nurse. The third Lineman, seeing people aiding the Lineman, moved the truck to allow the ambulance access. The Gang Foreman notified the Power Director by radio of the emergency. The LILCO Lineman also went to get help. After determining that the Lineman had lost his pulse, the second Lineman initiated life breaths while the nurse performed chest compressions. They performed CPR until the Medical Crew from the Rockville Center Fire Department arrived

and took control of the situation. The Lineman was transported to the South Nassau Hospital via ambulance, where he was pronounced dead.

Post-Incident Investigation

No eyewitnesses saw the Lineman lose contact with the tower. Several witnesses observed the Lineman after he lost contact or landed on the ground.

FRA has no regulations covering the Lineman's duties. However, there are Federal regulations governing electric power generation, transmission, and distribution. These are located in Title 29 CFR 1910.269. Because the LIRR is a public entity, these Federal regulations are enforced by the New York State Department of Labor, instead of OSHA.

The LIRR had a 3-year apprenticeship program for Linemen that included a formalized training program. Topics covered by this program included Basic Electricity and Electronics, Electrical Fundamentals, and Electrical Maintenance Work. Pole climbing training was provided by an outside firm. Con Edison was said to have presented a course. Typically, the climbing of steel towers and poles was learned on the job. During their first six months, Trainees did not climb.

LIRR did not assure that employees received training to properly utilize fall protection equipment (e.g. safety belt and harness; and rope and pulley) while climbing. Therefore, a variety of methods were commonly used, some of them very unsafe. Most employees tied off with a safety belt before performing their work, and wore personal protective gear, such as Lineman boots, safety belt and harness, and a pair of electrician gloves. The High-Tension Linemen also carried a small pulley and a half-inch rope, approximately 125 to 140 feet, which was used to raise work materials. The rope usually was attached to the pulley, which had a metal hook which hooked through a loop on the Lineman's belt. Normal practice was to either carry the rope coiled or to let it play out. In the case of playing out the line, a Groundsman had responsibility for keeping the line free of entanglements. Once in position, the pulley was secured to the tower to raise the materials.

On June 5, the Lineman was insulating the LIRR power lines in a job called "rubbering up." This means covering the LIRR lines with insulating material to allow the LILCO employees to work on their lines above. Earlier, the Lineman had climbed Tower 11 to remove this insulation.

An autopsy and toxicological tests were performed. The autopsy was performed by the Nassau County Medical Examiner's Office. In the opinion of the Medical Examiner, the Lineman died as a result of Multiple Blunt Injury Trauma. The manner of death was listed as Accidental on the Medical Examiners' report. Toxicological tests were negative for the presence of alcohol and drugs.

REPORT: FE-16-97

RAILROAD: Central Michigan Railway Company (CMGN)

LOCATION: Bay City, Michigan

DATE, TIME: June 6, 1997, 9:35 p.m., EST

PROBABLE CAUSE:

Failure of Engineer to stop movement of train when communication was lost.

POSSIBLE CONTRIBUTING FACTOR:

Failure of the Conductor's radio due to low battery voltage.

EMPLOYEE:	**Craft**	**Transportation**
	Activity	Switching
	Occupation	Conductor
	Age	50 years
	Length of Service	Seven years
	Last Rules Training	Dec. 18, 1996
	Last Safety Training	Dec. 18, 1996
	Last Physical Exam	Oct. 5, 1993

Circumstances Prior to the Accident

On June 6, 1997 at 9 p.m., an Engineer and Conductor reported for duty for Yard Job 703 at Winona Yard, Bay City, Michigan, after receiving the statutory off-duty period. Locomotive 8802 was assigned to Yard Job 703 that day. After the Engineer had completed the locomotive inspection, the Crew moved the locomotive off of the engine dock track and proceeded to Track No. 3 to pick up a cut of cars. The Crew then shoved and released (kicked) an unknown number of cars to Track No. 2 East. The Crew then pulled the remaining 14 cars (12-2) southward to clear traffic on the Euclid Avenue Grade Crossing. After traffic had cleared the crossing, the Conductor advised the Engineer by radio that traffic was clear and instructed him to shove ahead (north) 20 to 25 car lengths to make a coupling on Track No. 1.

The Engineer was seated at the locomotive controls on the east side of the locomotive cab facing north. The Conductor was positioned on the west side of the 14th car (to become the lead car during the shoving move).

The Conductor told the Engineer by radio that the crossing gate was down and traffic was clear. As the locomotive was nearing the Euclid Avenue Grade Crossing, the Engineer stated he was slowing down because he had no other instructions from the Conductor by radio. As the locomotives cleared the crossing, the Engineer applied the independent brake, and the train went into emergency.

The weather was clear, and the temperature was 76° F.

The Accident

After the emergency brake application occurred, the Engineer attempted to contact the Conductor on the radio several times, with no response. He then called the Dispatcher for a radio check. The Dispatcher stated the radio was working properly. The Engineer dismounted the locomotive and found the Conductor lying on the ground between Track No. 1 and the main track where the impact had occurred. He removed the Conductor's radio from the radio case and called the Dispatcher, who did not respond. He then went to the office and called the Dispatcher by telephone to request emergency assistance.

The Michigan State Police arrived at the scene at 9:45 p.m., a Bay Health Ambulance arrived at 9:55 p.m., and the Bangor Township Fire Department arrived at 9:55 p.m.

Please see the attached diagram of Winona Yard and the Euclid Avenue Grade Crossing to better visualize the accident scene and chain of events that led up to the fatality.

Post-Accident Investigation

The investigation revealed a severe impact between AEX 112201 (covered hopper), the southernmost car of 15 standing cars, and UP 273042 (bulk head flatcar), the northernmost car of the 14 cars being shoved onto Track No. 1. Evidence indicates the Conductor was riding on the west side of the bulk head flatcar in a position to be crushed by the resulting impact. The force of the collision caused considerable damage to both cars. It was also noted that the angle cock on the bulk head flatcar was open after the accident, suggesting an explanation for the emergency brake application. Measurements taken at the scene revealed the impact had occurred approximately16 car lengths from the point where the northbound movement had begun.

The Engineer stated that the speed just prior to the accident was estimated at 6 to 8 mph. The event recorder removed from the locomotive was found to be inoperable and contained no data to substantiate the Engineer's statement. The maximum authorized speed at the location of the fatality was 10 mph.

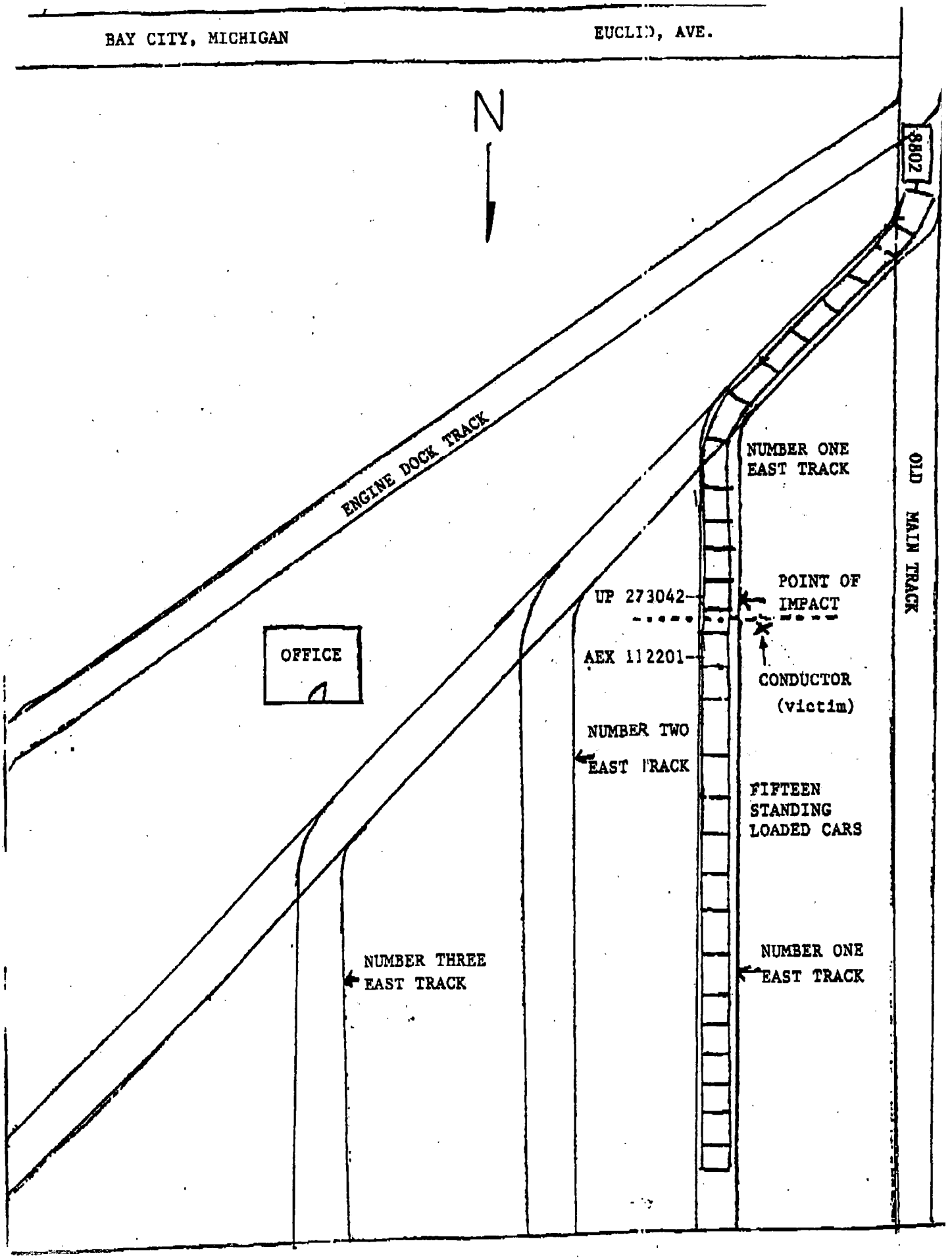
Tests were performed on the Conductor's battery charger and radio by an independent Motorola dealer. The tests revealed that the charging current measured 41 milliampere (MA). The manufacturer's specification for charging was 45 MA plus or minus 10 MA. Therefore, the charger was operating properly.

The radio was tested on June 9 and 10, 1997. The radio had been turned off, but had not been charged since the day of the accident. The radio was operated in standby mode 15 minutes prior to testing. The test revealed that the radio battery did not have sufficient voltage to operate in the transmit mode. Transmit power started at two watts and dropped to zero after 15 seconds of transmit time. A second test was performed after allowing the battery to recover. This time, transmit power measured seven tenths of a watt, and dropped to zero after two seconds. Transmitter modulation and frequency stability were present even at a low transmit power level. The receiving power was found to be sufficient. A broken antenna center pin was also discovered, but was not believed to be a factor.

A test of the battery charging capacity performed on June 10 revealed that the radio rated at 100 percent power after 14 hours of charging. The radio was then disassembled to check for intermittent operational problems in both the transmit and receive modes. No intermittent problems were discovered.

Based on the results of the radio tests, the investigators concluded that the Conductor's radio battery was not fully charged prior to being used on the day of the accident. The Conductor was allowed to keep the charger at his residence and was responsible for charging the unit before use each day. They could not determine why the battery had not been charged as required.

Toxicological tests were performed on the Engineer and the deceased Conductor, under FRA authority. Test results were negative.


BAY CITY, MICHIGAN
EUCLID, AVE.
N
8802
ENGINE DOCK TRACK
OFFICE
NUMBER ONE
EAST TRACK
OLD MAIN TRACK
POINT OF
IMPACT
UP 273042
AEX 112201
CONDUCTOR
(victim)
NUMBER TWO
EAST TRACK
FIFTEEN
STANDING
LOADED CARS
NUMBER THREE
EAST TRACK
NUMBER ONE
EAST TRACK

REPORT: FE-17-97

RAILROAD: Burlington Northern Santa Fe Railroad Company (BNSF)

LOCATION: San Bernardino, California

DATE, TIME: June 18, 1997, 3:29 p.m., PST

PROBABLE CAUSE:

The Driver of a 1-ton BNSF truck (with Crew cab) was transporting five BNSF Maintenance-of-Way (MOW) Employees south on California Freeway 215 when he fell asleep, causing the truck to overturn.

EMPLOYEE:	**Craft**.....	**Maintenance of Way**
	Activity.....	Transport of MOW employees from the job site to the yard at the end of their shift.
	Occupation.....	Track Foreman
	Age.....	45 years
	Length of Service.....	20 years
	Last Rules Training.....	May 26, 1996
	Last Safety Training.....	Oct. 5, 1994

Circumstances Prior to the Accident

The BNSF MOW Crew reported for duty at 6 a.m., on June 18, 1997, at the San Bernardino Rail Yard. Prior to departure, the Driver performed a safety check of the BNSF truck, California License No. 4A05322. The Foreman conducted a safety job briefing on the day's activities with the Section Track Crew. At approximately 6:30 a.m., the Crew departed the yard en route to E Street in Hesperia, California, milepost 0.03 on the Lucerne Valley Subdivision. The Crew was assigned to add walkways for pedestrian traffic at E Street by extending the existing concrete crossing panels. The Driver and the Track Foreman were in the front seat and three Trackmen were seated in the rear seat. At approximately 8 a.m., upon arriving at the job site in Hesperia, the Foreman called the BNSF Train Dispatcher and informed him that the Lucerne Valley Subdivision was out of service for June 18, 1997.

The Lucerne Valley Subdivision was on the Burlington Northern Santa Fe Railway, as noted in the Southern California Division Timetable No. 2, effective Oct. 1, 1996.

Upon arriving at E Street, the Foreman contacted the BNSF Track Supervisor and informed him that there were some bad ties at each end of the crossing. The Foreman was instructed to replace the ties and informed that the Track Supervisor would come and inspect the job site later. Between 9:30 a.m. and 12 p.m., the Crew replaced three ties on the east end and two ties on the west end of the crossing. The concrete crossing panels were then placed next to the previously installed panels to extend the pedestrian crosswalk. The Welding Foreman arrived at the crossing to weld the angle iron surrounding the concrete crossing panels. At about 12:30 p.m., the Welding Foreman asked the Track Foreman to take the Crew back to the section house in Hesperia to get more welding rods so he could complete the project.

The Crew departed E Street and went to the section house to obtain the welding rods as requested. Returning to E Street, the Crew Members delivered the welding rods and ate their lunch. After lunch, at 1:30 p.m., the Crew cleaned up the scrap around the job site. The Foreman instructed the Driver to take the Crew back to the section house where they unloaded the scrap from the truck. At 2:30 p.m., the Foreman contacted the Roadmaster and informed him that the job was completed and they were returning to the yard in San Bernardino.

Traveling up Main Street in Hesperia, the Foreman instructed the Driver to stop at a hamburger restaurant so he could use the rest room. When the Foreman returned, the Crew got back into the truck and departed for San Bernardino. At 2:45 p.m., the Crew Members entered Interstate Highway 15 and drove in the slow lane at about 55 mph. At approximately 3:20 p.m., they merged onto Interstate Highway 215 and stayed in the slow lane traveling at about 55 mph.

The sky was clear and visibility good. The temperature was 97° F.

The Accident

While southbound on Interstate 215 at 3:30 p.m., the truck drifted to the right onto the dirt shoulder, continuing for approximately 300 feet. Then the Driver attempted to re-enter the highway, veering to the left. The Driver was unable to regain control of the truck and over-corrected back to the right. As a result, the truck went over an embankment, overturned, and rolled onto the perimeter fence, coming to rest on top of the Track Foreman who had been partially ejected. ***Please see the attached five diagrams of Interstate 215, Hesperia, California, to better visualize the accident scene and events that led up to the fatality.***

Post-Accident Investigation

The California Highway Patrol accident report and the interviews of witnesses at the scene of the accident revealed the Driver of the BNSF truck apparently had fallen asleep, allowing the truck to leave the highway. Then, while attempting to re-enter the highway, the Driver lost control of the truck, resulting in the truck going over the embankment and turning over. The passenger was partially ejected, and the vehicle rolled over and came to rest on top of him. According to the CHP report, the victim had not been wearing a seat belt at the time of the accident.

The Driver and passengers were tested for drugs with negative results.

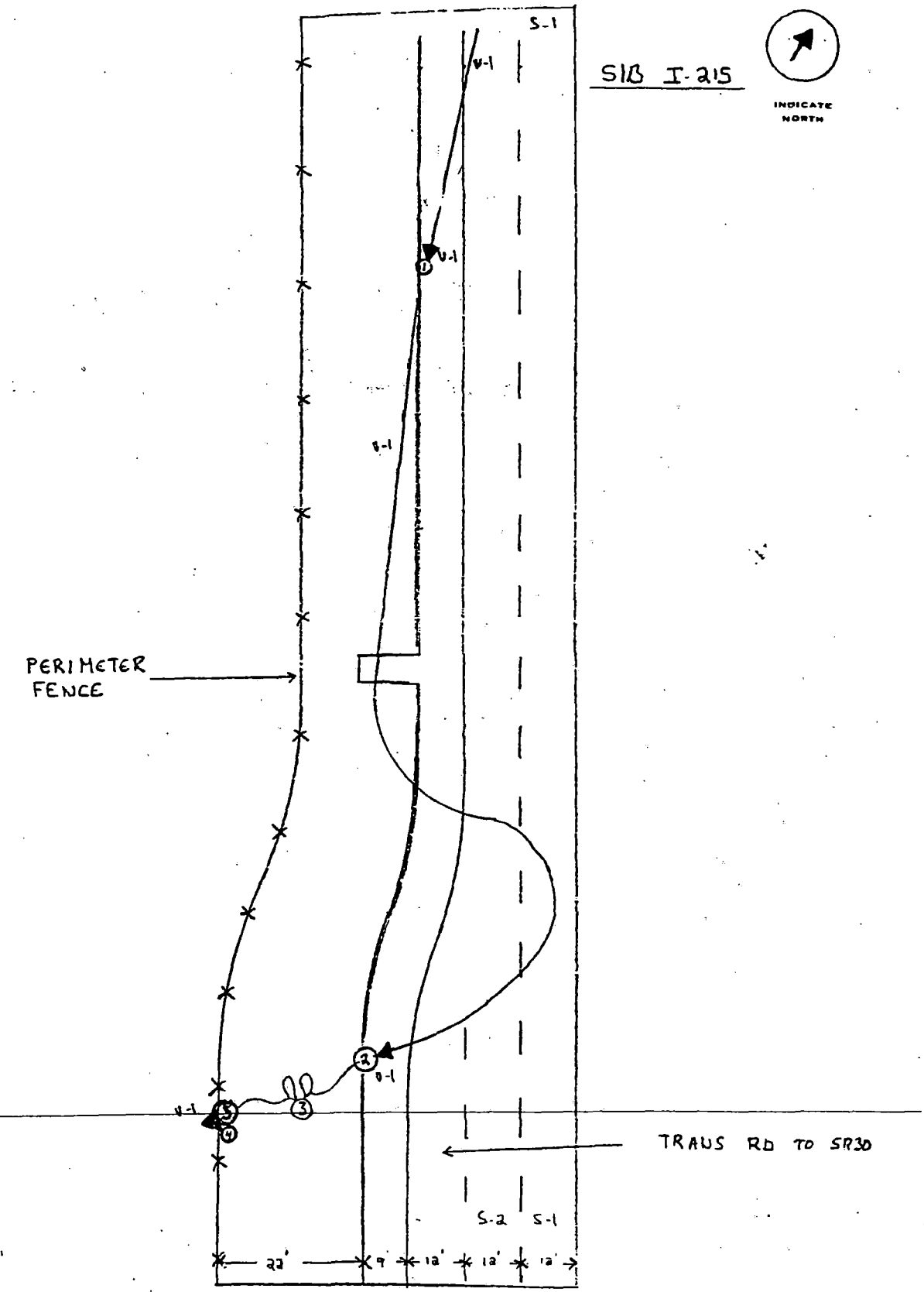
STATE OF CALIFORNIA

FACTUAL DIAGRAM

PAGE 5

DATE OF COLLISION	TIME (2400)	NCIC NUMBER	OFFICER I.D.	NUMBER
MO. 6 DAY 18 YR. 97	1530	9860	11960	

ALL MEASUREMENTS ARE APPROXIMATE AND NOT TO SCALE UNLESS STATED (SCALE -



DRAWN BY	I.D. NUMBER	MO.	DAY	YR.	REVIEWER'S NAME	MO.	DAY	YR.
I.L. Jackson	11960	6	18	97				

STATE OF CALIFORNIA

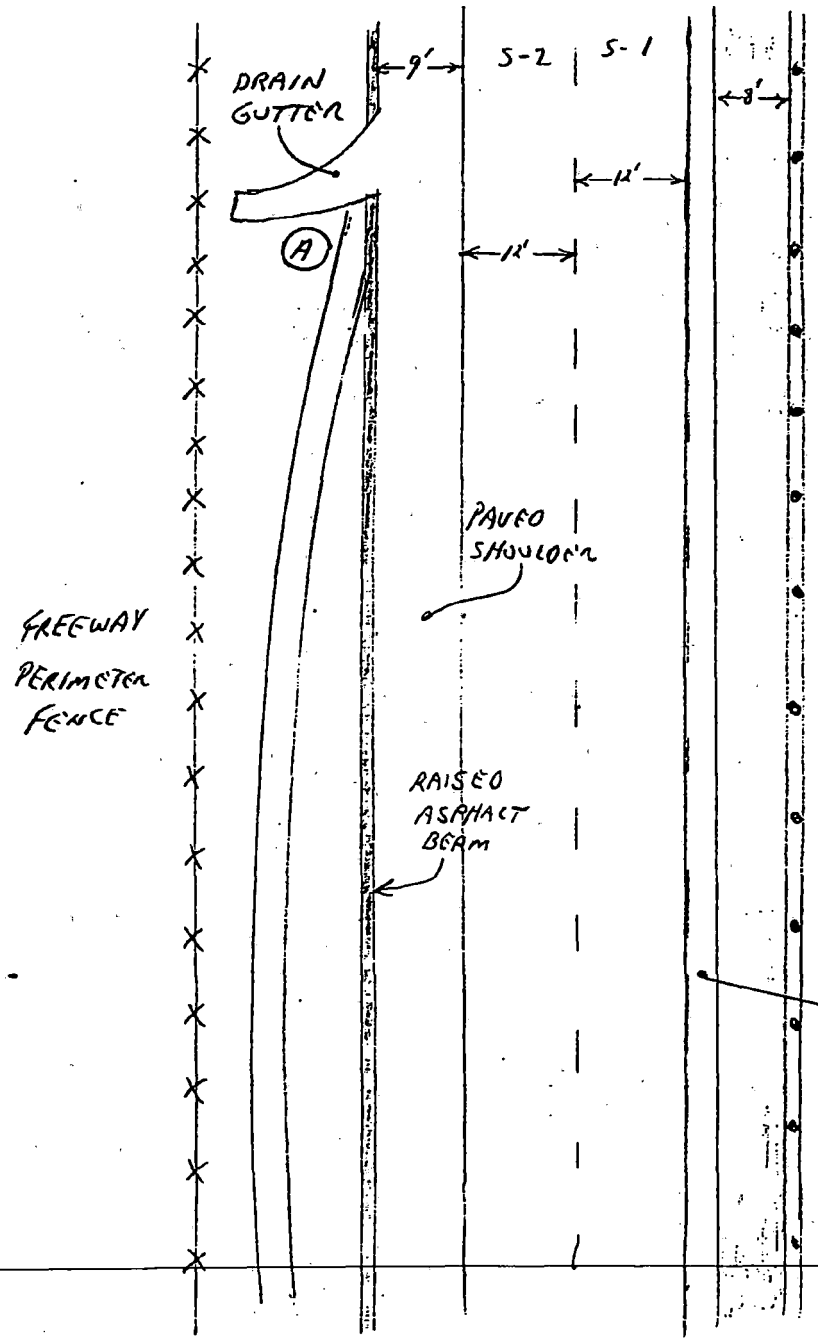
FACTUAL DIAGRAM

PAGE 6

DATE OF COLLISION MO. 6 DAY 18 YR. 97	TIME (2400)	NCIC NUMBER	OFFICER I.D.	NUMBER
	1530	9860	1960	

ALL MEASUREMENTS ARE APPROXIMATE AND NOT TO SCALE UNLESS STATED (SCALE -

INDICATE NORTH



I-215 (S/B)

DIAGRAM Pg 1 OF 4

DRAWN BY	I.D. NUMBER	MO. DAY YR.	REVIEWER'S NAME	MO. DAY YR.
K. WHITMORE	8814	6 20 97		

STATE OF CALIFORNIA

FACTUAL DIAGRAM

DATE OF COLLISION	TIME (2400)	NCIC NUMBER	OFFICER I.D.	NUMBER
MO. 6 DAY 18 YR. 97	1530	9860	11960	

ALL MEASUREMENTS ARE APPROXIMATE AND NOT TO SCALE UNLESS STATED (SCALE =

INDICATE NORTH

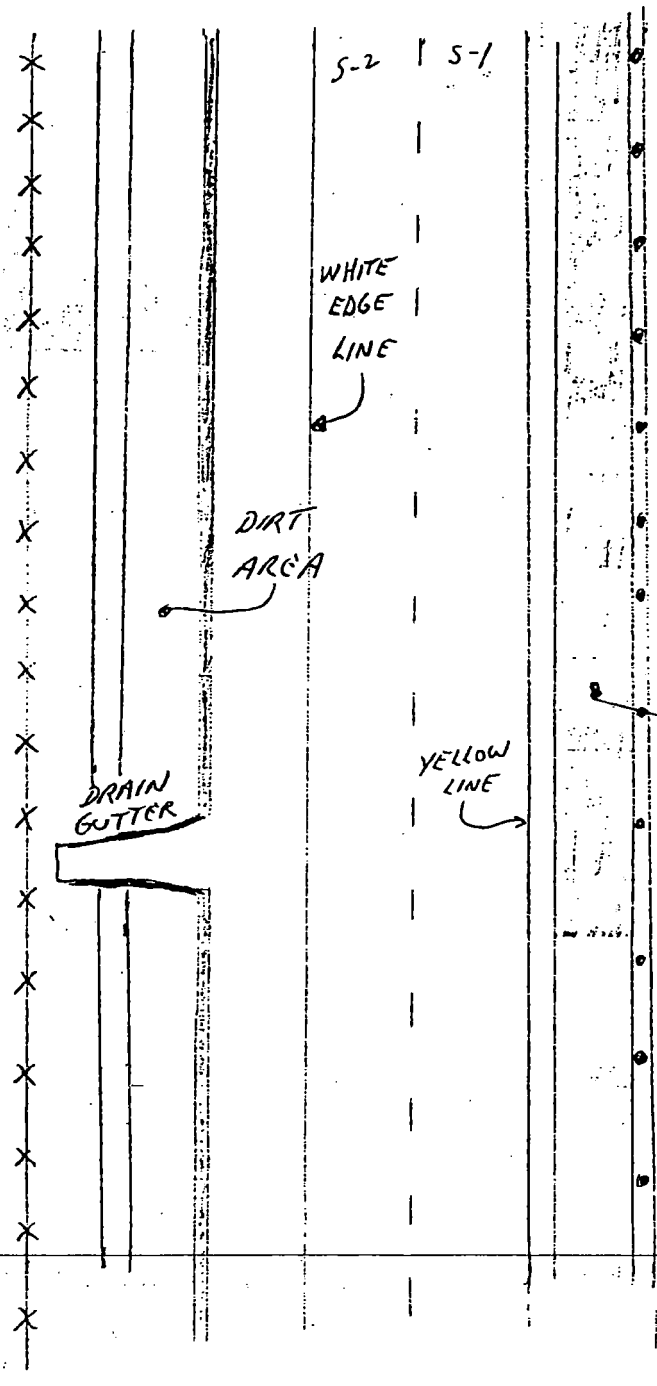


DIAGRAM Pg. 2 of 4

TOPG 8

DRAWN BY	I.D. NUMBER	MO. DAY YR.	REVIEWER'S NAME	MO. DAY YR.
K. WHITMORE	8814	6 20 97		

STATE OF CALIFORNIA

FACTUAL DIAGRAM

PAGE 8

DATE OF COLLISION	TIME (2400)	NCIC NUMBER	OFFICER I.D.	NUMBER
MO. 6 DAY 18 YR. 97	1530	9860	11960	

ALL MEASUREMENTS ARE APPROXIMATE AND NOT TO SCALE UNLESS STATED (SCALE -

INDICATE NORTH

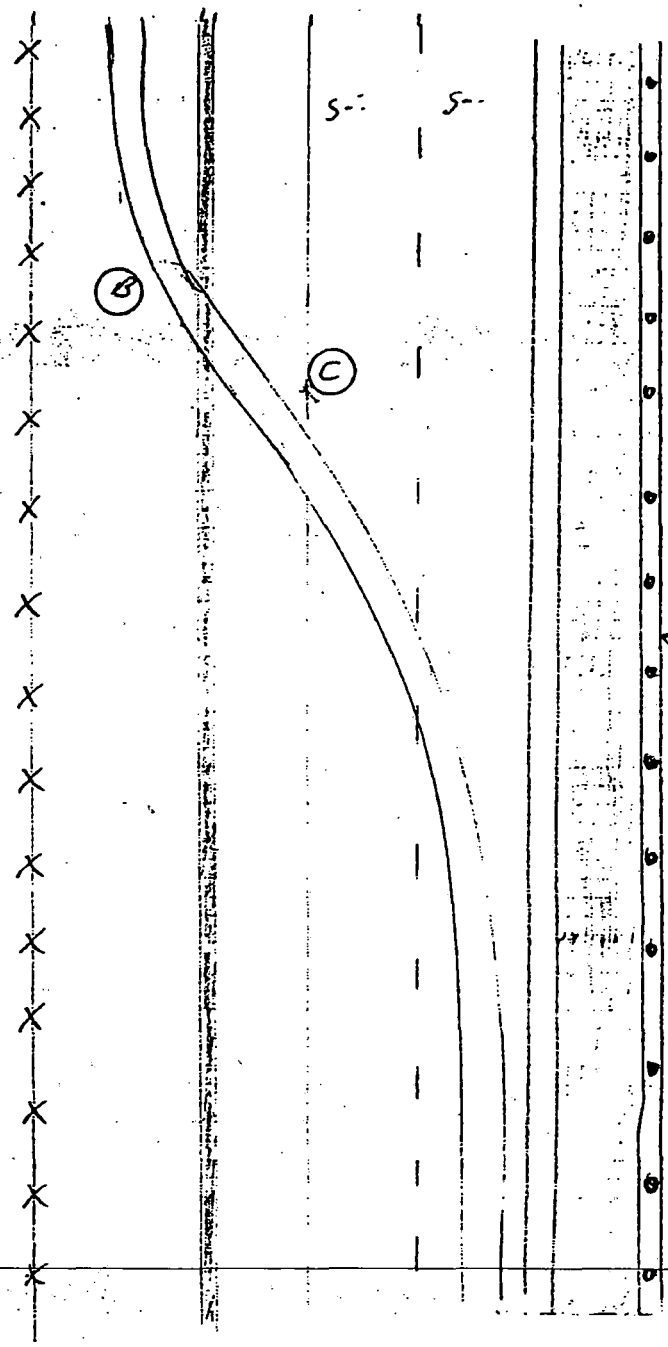


DIAGRAM Pg. 3 of 4

DRAWN BY	I.D. NUMBER	MO. DAY YR.	REVIEWER'S NAME	MO. DAY YR.
K. WHITMORE	8814	6 20 97		

STATE OF CALIFORNIA

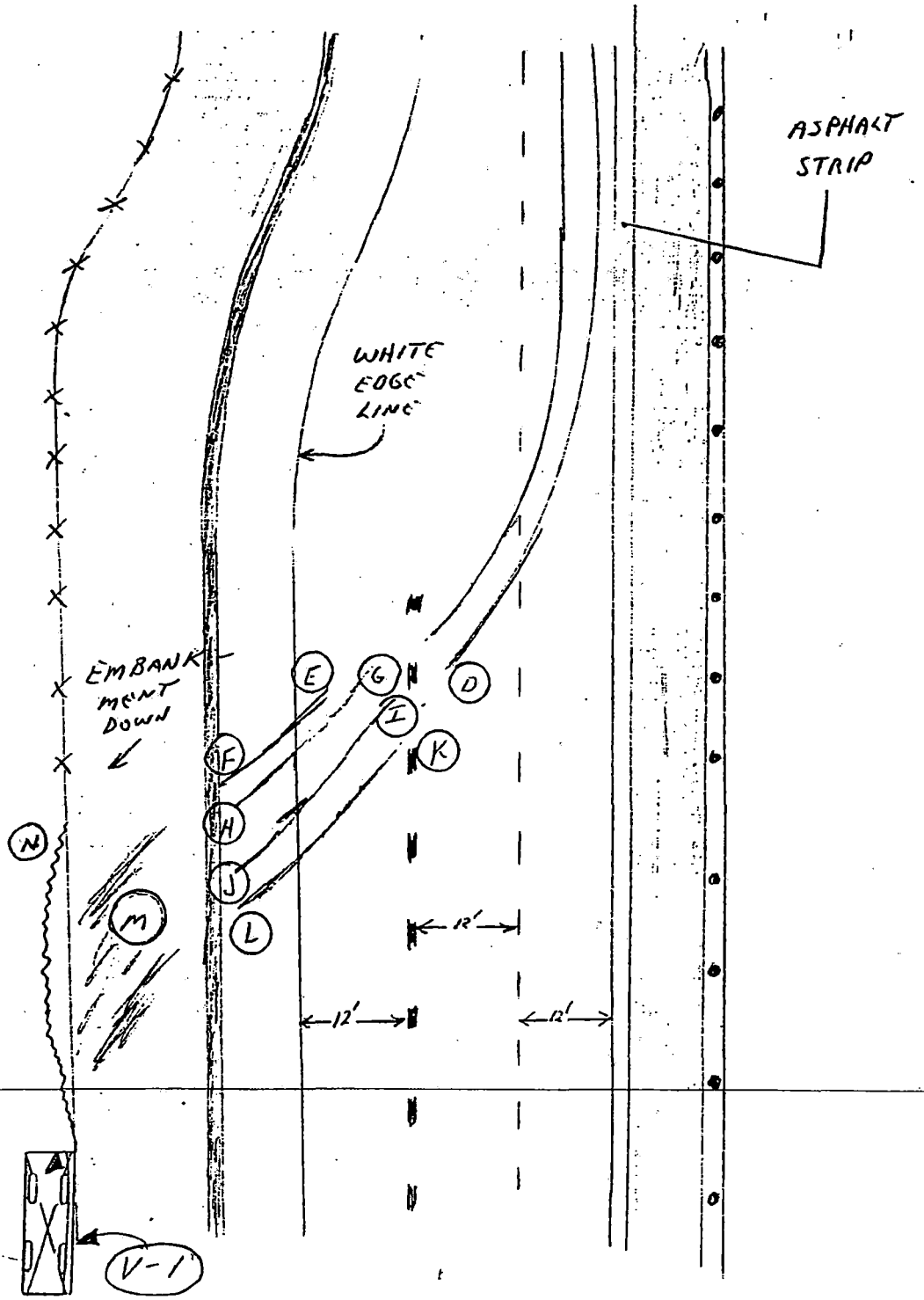
FACTUAL DIAGRAM

DATE OF COLLISION	TIME (2400)	NCIC NUMBER	OFFICER I.D.	NUMBER
MO. 6 DAY 18 YR. 97	1530	9860	11960	

ALL MEASUREMENTS ARE APPROXIMATE AND NOT TO SCALE UNLESS STATED (SCALE -

INDICATE NORTH

4



*

DIAGRAM NOT TO SCALE AND CONDENSED SOMEWHAT TO SHOW ENTIRE SCENE

K.W.

DIAGRAM Pg. 4 of 4

DRAWN BY	I.D. NUMBER	MO. DAY YR.	REVIEWER'S NAME	MO. DAY YR.
K. WHITMORE	8814	6 20 97		

REPORT: FE-18-97

RAILROAD: Union Pacific Railroad Company (UP)

LOCATION: Portland, Oregon

DATE, TIME: June 24, 1997, 4:30 a.m., PST

PROBABLE CAUSE:

Switch Foreman was struck by a moving car after placing himself between cars to release a hand brake.

EMPLOYEE:	**Craft**	**Transportation**
	Activity	Switching
	Occupation	Switch Foreman
	Age	53 years
	Length of Service	28 years
	Last Rules Examination	June 12, 1995
	Last Safety Training	Oct. 18, 1996
	Last Physical Examination	October 1993

Circumstances Prior to the Accident

Following completion of a required off-duty period, the employee went on duty at 11:59 p.m., on June 23, at Brooklyn Yard. The employee was assigned the Switch Foreman's position in a Crew comprising an Engineer, Switch Foreman, and Helper. The Crew was called to work Yard Switching Assignment No. YEXS-810, which required an 8-hour shift, to perform switching operations at Brooklyn Yard using Locomotive SP 2677. The Foreman was observed by fellow employees, who indicated that he had appeared to be fit for duty.

The Crew performed various switching operations during the shift with no unusual occurrences. At approximately 4 a.m., the Crew received instructions to collect cars off the south end of three tracks in the yard and place the entire group of cars onto Track No. 2. (Geographic direction is used throughout this report, although geographic north is railroad timetable east.) The Crew gathered the 14 cars, including three 5-platform, articulated, intermodal rail cars, and were pulling the cars south on the lead to clear the switch, providing access to Track No. 2. The movement was stopped due to a switching move occupying the lead ahead. The Foreman

remained with the locomotive. The Helper walked over to the south end of the cars standing on Track No. 2. He wanted to be in position to make the coupling when the Crew started shoving the cut of cars they were moving onto Track No. 2.

Approximately 10 minutes later, the freight train cleared the lead ahead of the Switch Crew. The Engineer contacted the Foreman by radio and told him that he was ready to continue the movement south. The Foreman acknowledged the transmission and told the Engineer to start pulling. Although the Engineer could not see the Foreman at the time of the radio conversation, he believed he was standing on the east side of the cut of cars near the locomotive.

The Engineer stated that he began pulling the cars at a speed between 3 and 7 mph. As the movement continued, the Foreman was having a radio conversation with the Yardmaster. The Foreman reported that components of a railroad end-of-train-telemetry device were lying on the ground in the toe path (walkway) near where the Foreman was working. The Yardmaster said that the Car Department had been instructed to remove it. The Foreman responded "Okay."

Weather conditions were dark and clear, and the temperature was 52° F.

The Accident

A few minutes later, the Helper attempted to contact the Foreman by radio. The Foreman did not respond. The Helper made a second transmission and still received no response. The Helper then contacted the Yardmaster and asked him to try to contact the Foreman. The Helper thought the Foreman's radio may not have been working properly. The Yardmaster made two attempts and received no response.

The Helper then called the Engineer and asked if he was still pulling south. When the Engineer said that he was, the Helper told him to stop the movement. The Helper then started walking south up Track No. 2 toward the lead switch. He intended to find the Foreman and inform him about his malfunctioning radio. At approximately 4:30 a.m., the Helper found the employee lying face up next to the rail on the east side of the lead near the switch providing access to the yard tracks. The trailing car of the cut of cars they were pulling stopped about 365 feet south of the location where the Foreman lay. The Helper contacted the Yardmaster and told him that he had found the Foreman lying by the track and asked him to call for emergency help.

The Portland Police Department received notification at 4:30 a.m. Paramedics arrived at the scene at 4:36 a.m. The Coroner was notified at 4:43 a.m. and arrived at 5:03 a.m. The employee was pronounced dead at the scene.

Please see the attached diagrams of Brooklyn Yard to better visualize the accident scene and chain of events that led up to the fatality.

Post-Accident Investigation

The Multnomah County Medical Examiner's Office performed an autopsy. The Autopsy Report and Death Certificate stated the cause of death as "Multiple Injuries." Mandatory toxicological testing of the deceased was performed under the authority of 49 CFR Part 219 Subpart C. The results were negative.

Union Pacific officials found a battery-powered lantern lying approximately eight feet, six inches from the body. The lantern was in the ***on*** position and operating. The end-of-train telemetry device that was lying on the ground in the work area was not involved in the accident. It was located 80 feet away from the Foreman's body and on a separate lead. It was not in a position where the employee could have tripped on the device to fall into the path of the cars.

Inspection of the next to last car (TTOX 145923), of the cars being moved, revealed the hand brake had been applied. The hand brake and its release handle were located at the trailing end of the car and just east of the center. The hand brake's release handle could only have been accessed by either going on the car or by standing on the ground at the end of the car. Standing on the ground at the end of the car would have placed an individual between this car and the last car in the cut. FRA's examination of the safety appliances revealed nothing that could have caused or contributed to the accident.

Inspection of the last car (NS 157024) revealed evidence of body tissue on the east side of the leading wheels. The evidence indicated that the Foreman, while trying to release the hand brake from the preceding car, either fell from a position on the trailing end of the car or had placed himself between the cars and lost his footing. He then was struck by the following car.

The railroad reported no damage to equipment as a result of the accident.

The Western Region Timetable No. 1, effective April 14, 1996, authorized a maximum speed of 10 mph on this yard lead. However, the locomotive was not equipped with an event recorder to identify the speed of the train.

In response to this fatality, UP's Portland Division implemented Accident Prevention Alert No. 11, which reviewed possible causes of the fatality and the applicable safety rules when releasing hand brakes or working around moving equipment. The railroad also conducted safety meetings with all employees to discuss the accident.

UP cited the following Operating Rules as applicable:

70.32.4 Employees must maintain a safe distance from equipment and not cross or step foul of tracks closely in front of or behind moving equipment, or close to the end of equipment; go between equipment if the opening is less than one car length; or

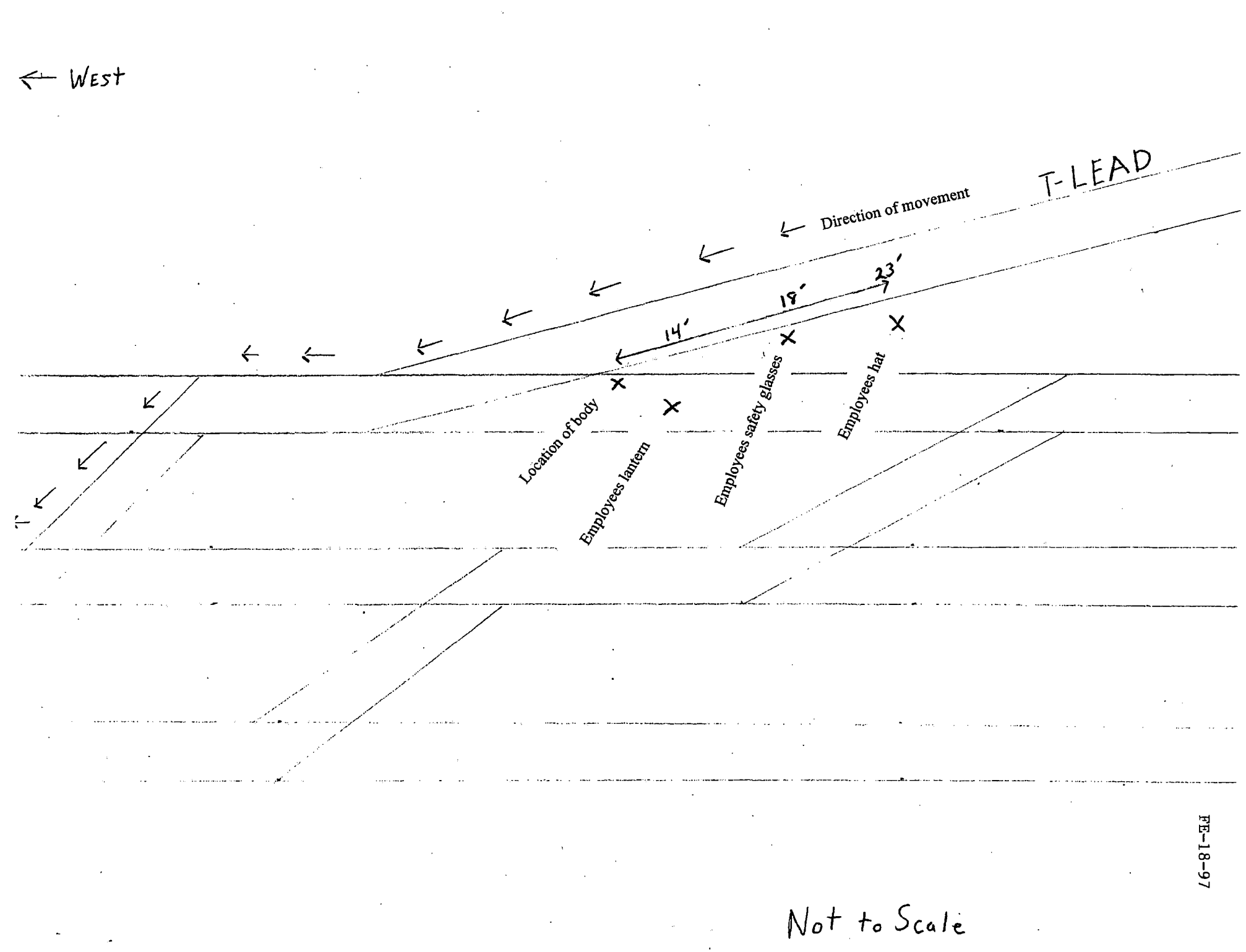
cross tracks in front of or behind standing equipment unless there is at least 20 feet between the employee and the equipment.

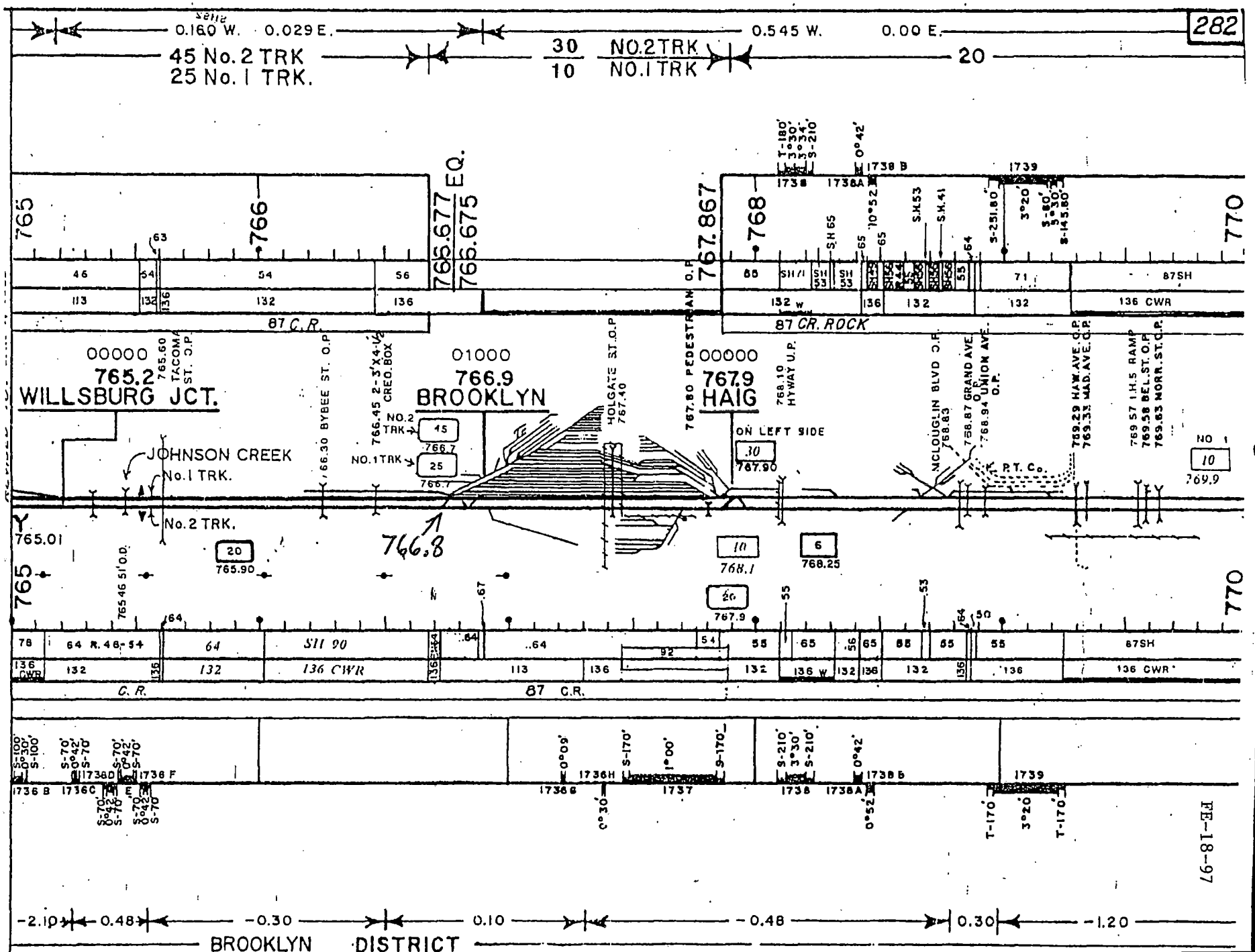
80.21.1 Employees must not go between or in front of a moving engine or car to uncouple, open, close, or arrange knuckles or couplers; to manipulate other appliances; or for any other reason.

81.17 [Investigators were unable to determine whether this rule applied to this particular accident, but UP found it important to include in the safety meetings.] Employees operating hand brakes must inspect the pawl, ratchet, and brake wheel for defects. Employees must have firm footing and hand hold to prevent slipping, falling, or injuries (e.g. sprains, strains).

Employees climbing on cars or applying hand brakes must maintain at least a 3-point contact with the car. Three-point contacts comprise both feet and one hand ***or*** both hands and one foot touching the car.

While applying or releasing hand brakes on cars, employees must: not use end ladders to go up or down the car; not step directly from the side ladder to the brake step, nor from the brake step to the side ladder without first placing feet firmly on the end ladder tread; not brace any part their body against another car; have one hand securely grasping the hand hold while the other hand is operating the brake; obtain firm footing and never place feet in a wheel or on a hand brake pawl; not place stress on hand brakes at the moment when coupling impact may move the car; not hold brake tension on a moving car by hand without using pawl and rachet; use caution when releasing hand brakes; obtain help when necessary; avoid being struck by the brake wheel when the pawl is released; and avoid having clothing or hands caught in the spinning brake wheel.


← West
T-LEAD
Direction of movement
14'
18'
23'
Location of body
Employees lantern
Employees safety glasses
Employees hat
T
Not to Scale
FE-18-97


282
0.160 W. 0.029 E.
0.545 W. 0.00 E.
45 No. 2 TRK
25 No. 1 TRK.
30
10
NO.2 TRK
NO.1 TRK
20
765
766
768
770
765.677 EQ.
766.675
767.867
765.2
WILLSBURG JCT.
766.9
BROOKLYN
767.9
HAIG
767.80 PEDESTRIAN O.P.
768.10 HYWAY U.P.
765.60 TACOMA ST. O.P.
766.30 BYBEE ST. O.P.
766.45 2-3'X4-1/2 CREO. BOX
HOLGATE ST. O.P. 767.40
MCLOUGLIN BLVD O.P. 768.83
758.87 GRAND AVE. O.P.
768.94 UNION AVE. O.P.
769.29 HAW. AVE. O.P.
769.33 MAD. AVE. O.P.
769.57 I.H.5 RAMP
769.58 BEL. ST. O.P.
769.63 MORR. ST. O.P.
JOHNSON CREEK
No.1 TRK.
No.2 TRK.
NO.2 TRK
NO.1 TRK
ON LEFT SIDE
P.T. Co.
765.01
766.8
768.1
768.25
769.9
87 C.R.
87 CR. ROCK
136 CWR
87SH
1736 B
1736C
1736D
1736 E
1736 F
1736G
1736H
1737
1738
1738A
1738 B
1739
FE-18-97
2.10
0.48
0.30
0.10
0.48
0.30
1.20
BROOKLYN DISTRICT

REPORT: FE-19-97

RAILROAD: Norfolk Southern Railway Company (NS)

LOCATION: Rowesville, South Carolina

DATE TIME: June 24, 1997, 8:58 p.m., EST

PROBABLE CAUSE:

The Conductor did not insure the switch was in the proper position prior to authorizing his train to make a reverse movement.

EMPLOYEE:

Craft	**Transportation**
Activity	Switching
Occupation	Conductor
Age	21 years
Length of Service	Two years, six months
Last Rules Training	Feb. 3, 1997
Last Safety Training	May 21, 1997
Last Physical Examination	January 1995

Circumstances Prior to the Accident

On June 24, 1997, a 2-person Norfolk Southern (NS) Train Crew (Conductor and Engineer) was called to perform duties on NS Local Freight Train No. P28 from Andrews Yard, Columbia, South Carolina, to Rowesville, South Carolina, and the return trip. The Crew reported for duty at 6 p.m. at the Andrews Yard engine house. The two Crew Members were regularly assigned to Train P28. They had worked together on June 23, 1997, the previous day, reporting for duty at 5 p.m. Working a total of 12 hours, they completed their tour of duty at 5 a.m. The Crew was off duty for a total of 13 hours, thus completing the required statutory off-duty period prior to reporting for duty on June 24, 1997.

Prior to departing the engine house, the Crew contacted the Train Dispatcher and the Andrews Yard Yardmaster for instructions. They received a Track Warrant from the Train Dispatcher to operate from Andrews Yard (Columbia) milepost (MP) SC127.5 eastward to Rowesville MP SC71. The Yardmaster informed the Crew Members that their locomotives were NS 5189 (east) and NS 5059 (west), and that their train was located on the westbound track. The Crew

Members proceeded from the engine house to the yard office where they received their industrial switching orders. They discussed the work to be performed and proceeded to couple the locomotives to the train (nine loads, 1,163 tons, and 687 feet in length).

Train P28 departed Andrews Yard in an eastward direction at approximately 6:45 p.m., and proceeded to Pasta Place at MP SC117, which was the first customer to be switched. At this location, the Crew set off five loaded cars and pulled two empty cars. This work was completed at approximately 7:15 p.m.

Train P28 then proceeded in an eastward direction to the next customer, Associate Chemicals, at MP SC76. At Associate Chemicals, the Crew re-spotted two cars and departed for Rowesville Siding with six cars. Rowesville Siding accommodated about 30 cars and was the turn-around point for Train P28.

The Crew arrived in Rowesville between 7:30 p.m. and 7:40 p.m. There were seven cars in the siding from the previous day. (Note: Train P28 typically left cars at this location to be placed on consists, at the request of various companies, for return trips to Andrews Yard.) Train P28 operated to the east end of the siding, where the Conductor dismounted, removed the end-of-train device (EOT), removed the derail, and lined the switch for the siding. The Train Crew entered the siding, coupling the six cars in their train to the seven cars already standing in the siding. The Conductor then uncoupled the locomotives from the 13 cars.

Upon completion of this move, the Conductor instructed the Engineer to operate the locomotives in an eastward direction to clear the switch. The Conductor then re-applied the derail, lined and locked the switch, removed the EOT from the ground, and placed it on the platform of the east locomotive (NS 5189). The Crew proceeded to the west end of the siding. The Conductor stopped the locomotives after they had cleared the switch at the west end of the siding. At this point, the Engineer changed operating stations (locomotives) for the return trip to Andrews Yard. He would now be in a position to operate from the west locomotive (NS 5059).

The operating controls for NS 5059 were on the south side of the mainline. The siding and the switch were on the north side of the mainline, which was the side from which the Conductor was directing the movement. The Conductor removed the EOT from the platform of NS 5189 and placed it on the ground near the switch. He unlocked and lined the mainline switch for the siding, removed the derail, and instructed the Engineer to shove east to a coupling, using specified car lengths via his portable radio.

After coupling to the 13 cars in the siding, the Conductor coupled the air hoses between the locomotive and the west car in the siding and instructed the Engineer to pull west, stopping at the fifth car in the siding. The Conductor made a cut between the fifth and sixth cars in the siding, and instructed the Engineer to pull west out of the siding with five cars.

The Conductor stopped the move clear of the mainline switch, applied the EOT to the fifth car, and instructed the Engineer to shove back five car lengths stating, "You're clear for 30; shove back five." The Conductor's intention was to assemble the train for its return trip to Columbia.

At the time of the accident, the temperature was 80° F, the weather conditions were hot and humid, and the sky was clear with full visibility for this hour (8:58 p.m.). It was clear enough that the Conductor was working without a lantern.

The Accident

The purpose of the switching moves was to cut the two rear cars off of the mainline, and then return to the siding with three cars and finish switching. After the Conductor had instructed the Engineer to shove back five cars, his next communication was to start calling (via radio) the number of car lengths left to go in the shoving move. The Conductor called "Four," then "Three," and that was the last communication the Engineer heard from the Conductor.

When the Engineer did not receive another signal from the Conductor, he stopped the train movement within 1 ½ car lengths. The Engineer made several attempts to reach the Conductor via radio, but there was no response. The Engineer went to the other side of the cab, looked out the window, and saw the Conductor lying on the ground. His feet were pointing in a northward position, on the north side of the north rail of the siding. The Engineer dismounted the locomotive and went to check on the Conductor, whom he found severed at the waist. His upper torso was underneath the fourth car (Car NW 177259) from the locomotives lying between the rails. The Conductor had been run over by both sets of trucks of the fifth car from the locomotives (SOU 88568) and the east trucks of NW 177259. The Engineer immediately called for help.

(Please see the attached two diagrams of the Rowesville Siding/Pass Track to better visualize the accident scene and chain of events that led up to the fatality.)

Post-Accident Investigation

The post-accident investigation disclosed that the Conductor had failed to line the switch for the mainline after applying the EOT to the rear of Rail Car SOU 88568. After pulling west from the siding with five cars and applying the EOT, the Conductor instructed the Engineer to shove east, informing the Engineer that the track was clear for 30 car lengths, but only to shove back five car lengths. The Conductor's intent was to cut two cars off of the mainline and return to the siding with the three remaining cars.

Evidence indicates that as the shoving move began, the Conductor turned away from the rolling equipment and walked toward the west in the foul of the siding track. At the same time, utilizing his radio, he was issuing movement instructions to the Engineer. The Conductor's failure to properly line the main track switch resulted in the cars re-entering the siding and

striking him in the back. As result of being struck by the rolling equipment, the Conductor was knocked to the ground and run over by his own train.

During his interview, the Engineer stated that after thinking about everything that had happened, he remembered that when the Conductor had radioed three car lengths, he had sounded somewhat faint. The Engineer also stated that he did not remember exactly how fast he was shoving, but estimated that the move was probably being made at between 5 and 10 mph. The tapes from the locomotive event recorder indicated that the maximum speed attained during the move was 8 mph.

A re-enactment of the shoving move performed by company officials indicated that the movement could be stopped within the required distance specified in the operating rules. However, it should be noted that these tests were conducted in anticipation of applying the brakes at a specified location.

Emergency response came from the Orangeburg County EMS, Branchville City Volunteer Fire Department, and South Carolina State Police. A representative from the Orangeburg County EMS Unit reported receipt of a call to respond at 10:18 p.m., and the unit arrived on the scene at 10:27 p.m. The Orangeburg County EMS personnel departed at 10:52 p.m.; however, they did not remove the body. The Branchville Volunteer Fire Department removed and carried the body to the Orangeburg County Regional Medical Center.

The toxicological tests FRA required on the deceased were completed at 5 a.m. at the Regional Medical Center.

NS officials were questioned about the disparity between the time the accident had occurred (8:58 p.m.) and the time the Orangeburg County EMS received a call (10:06 p.m.). Various excuses were given, such as the Dispatcher was working with a trainee; there was a mainline derailment at High Point, North Carolina; and the Dispatchers had difficulty determining which emergency service provider had jurisdiction of the accident area. However, the Railroad Police were not notified until 9:37 p.m. FRA investigators concluded that the Train Dispatchers' office failed to use this resource to obtain assistance in locating the appropriate emergency services.

The investigation revealed that the Conductor had frequent contacts from a variety of NS officials regarding safety compliance (18 safety contacts) and rules training (17 rules contacts). It should be noted that several different rules were discussed during each contact. NS reports that the Conductor's most recent operating rules class was Feb. 3, 1997. His last safety contact was May 21, 1997, and his last rules check was conducted on June 22, 1997. NS officials stated that while performing duties at the Rowesville Siding/Pass Track, that the Conductor was not in compliance with NS General Rule (GR) No.14, which resulted in his fatal injuries. The Conductor had been employed by NS for 2 ½ years (1/30/95), which means his last physical was a pre-employment exam. According to employment records, the Conductor had not

been injured during his career, but had received a 15-day suspension for a run-thru switch on Dec. 17, 1996.

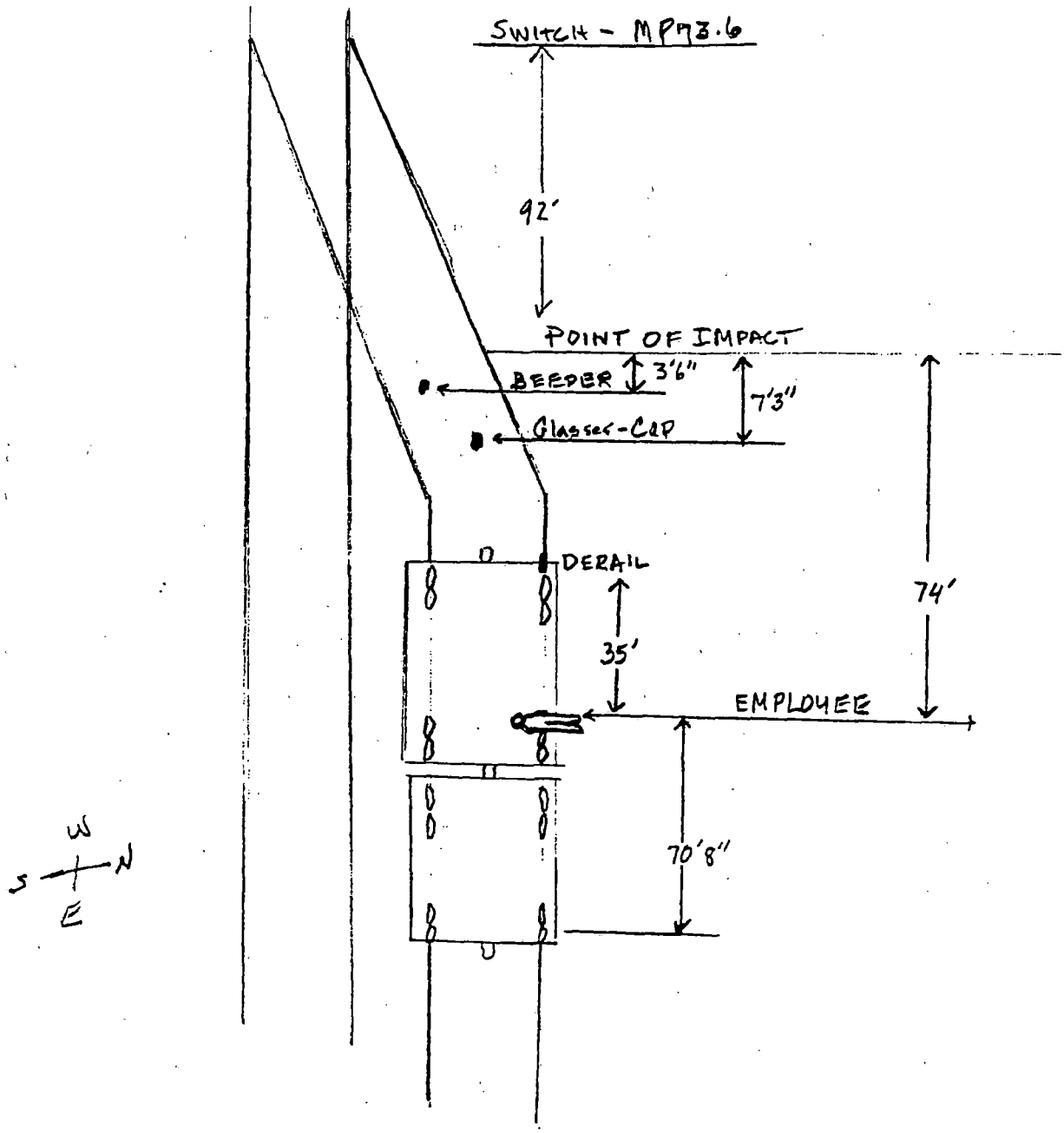
NS officials reported that within the past year, there had been a noticeable increase in GR 14 violations.

General Rule No. 14 states:

Employees must not stand on the track in front of closely approaching equipment, or step between coupled moving cars or engines, for any reason. They must not step between or immediately in front of standing cars or immediately in front of standing cars or engines unless necessary in the performance of duty, and then only after arranging for protection against the equipment being coupled to or moved.

Employees must not go between cars to adjust a drawbar or knuckle unless the cars are separated by at least 25 feet. (Exception: When an approved drawbar alignment device is used, [they should] be governed by special instructions.) When adjusting a coupler or knuckle, they must stand to one side with feet clear of the falling knuckle. When walking around the end of a standing car or between standing separated cars, employees must allow at least 10 feet of room between themselves and the nearest car, and they must expect sudden movement by cushion-under-frame draft gear.

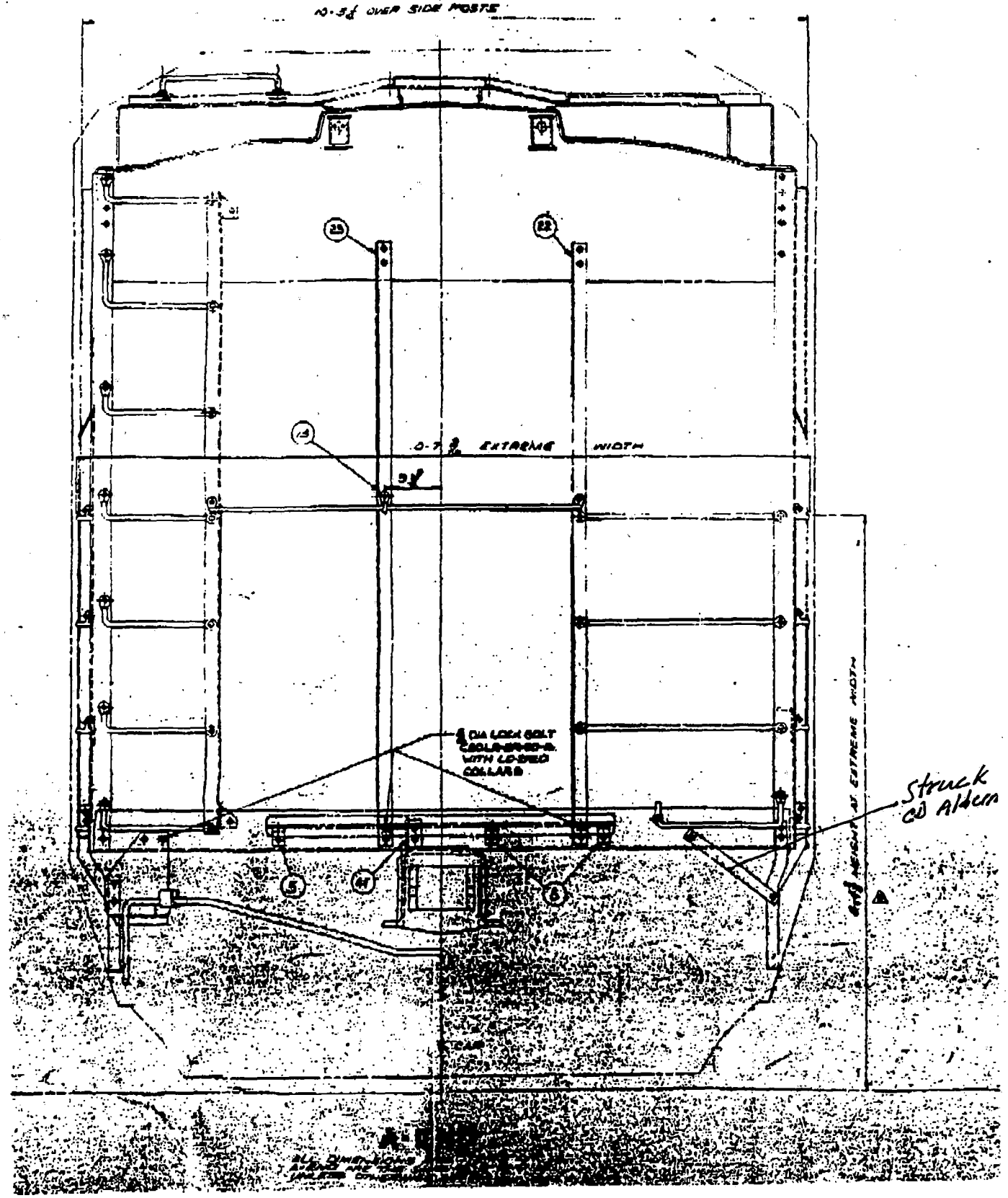
In response to the disturbing trend of non-compliance with GR 14, NS, the Brotherhood of Locomotive Engineers, and the United Transportation Union had produced a safety film, entitled "First Quarter - South End," to highlight the danger involved with this type of violation. NS advised FRA that the fatally injured Conductor had viewed this film in February 1997 and May 1997.



ACCIDENT SCENE

MP SC 73.6

ROWESVILLE, SC


10-3⅛ OVER SIDE POSTS
25
22
15
10-7⅜ EXTREME WIDTH
⅝ DIA LOCK BOLT
C&OLA-SR-60-B
WITH LO-SHED
COLLARS
Struck
@ Aldon
10-9⅜ AT EXTREME WIDTH
5
41
6

HCS 27

REPORT: FE-22-97

RAILROAD: Metro North Commuter Railroad (MNCW)

LOCATION: Stamford, Connecticut

DATE, TIME: July 18, 1997, 1:29 a.m., EST

PROBABLE CAUSE:

Failure of the Conductor/Flagman to remain clear of the main track.

POSSIBLE CONTRIBUTING FACTOR:

Failure of the Engineer of the approaching train to sound the horn.

EMPLOYEE:

Craft	**Transportation**
Activity	Installing Catenary Poles
Occupation	Conductor/Flagman
Age	40 years
Length of Service	Seven years, seven months
Last Rules Training	March 11, 1997
Last Safety Training	Aug. 14, 1994
Last Physical Exam	Jan. 24, 1997

Circumstances Prior to the Accident

Conductor/Flagman

On July 17, 1997, the Conductor/Flagman (Flagman) reported for duty at 8:30 p.m. at Stamford Yard. The Flagman was assigned to work with a 4-person Private Contractor Crew, installing catenary poles for the Center Island Platform Project at Stamford Station. After signing in, the Flagman reviewed the Bulletin Orders, General Notices, and Special Instructions.

The Flagman then proceeded in his private vehicle to Five Pocket. Five Pocket was a location west of Stamford Station and east of the Sheraton Hotel, on the north side of the New Haven Line, milepost 32.7, Catenary Pole No. 360. Five Pocket was the staging area for the Contractor

to erect catenary poles. There was a gate in the right-of-way fence that provided access to the track area.

Contractor Crew

On July 17, 1997, the Contractor Foreman (Foreman) and his 3-person Crew reported for duty at 9 p.m. at their headquarters in Stamford, CT. The Foreman had his Crew Members load their equipment into a company vehicle and proceed to Five Pocket.

Lineman/Groundman

On July 17, 1997, the Apprentice Lineman/Groundman (Apprentice Groundman) reported for an overtime assignment at 9 p.m. at MNCW's Bridgeport Maintenance Facility, Bridgeport, CT. The Apprentice Groundman had been assigned to work with another Groundman, and they were to ground the feeder lines for the Contractor. After signing in, the Apprentice Groundman proceeded to Five Pocket at Stamford, CT in his private vehicle.

The Work Site

At the work site, Track No. 3 had been removed from service between CP-229 (milepost 29.0) and CP-233 (milepost 32.9) by Bulletin Order No. 6-24, dated July 9, 1997 and effective 0030 Hours, Saturday, July 12, 1997. The Contractor had two hi-rail vehicles (a crane and a bucket truck) parked at Five Pocket. The vehicles were being used to erect catenary poles.

On July 17, 1997, the Apprentice Groundman arrived at Five Pocket at about 9:30 p.m., where he met the Flagman. The Contractor Foreman and his 3-person Crew arrived a few minutes later. The Flagman gave the Foreman and his Crew a job briefing. It was at this time that the Apprentice Groundman informed the Foreman that he was not allowed to work alone and that they had to wait for the other Groundman to report to the work site.

MNCW's Construction Inspector arrived at Five Pocket at 10:30 p.m. on July 17, 1997. He was informed of the missing Groundman. The Construction Inspector made several telephone calls and was informed that the Groundman had called in sick at the last minute. The Construction Inspector then arranged for a replacement Groundman from the wire train.

The replacement Groundman arrived at Five Pocket via his private vehicle at about 11 p.m. on July 17, 1997. The Groundman met with the Construction Inspector, Flagman, and Foreman for the Contractor to determine the location where the work was going to be performed. The Groundman requested permission from the Power Department to install grounds on the feeder wires at Catenary Poles Nos. 360 and 349. After receiving permission, the Groundman then instructed the Apprentice Groundman to install the first ground at Catenary Pole No. 360, milepost 32.7. The first ground was installed at 12:45 a.m. on July 18, 1997.

The Foreman requested permission from the Flagman to occupy Track No. 3 with his hi-rail vehicles and move into position at Catenary Pole No. 357 A/B, milepost 32.5, so he could begin work after the second ground was installed. The Flagman granted the Foreman permission to occupy Track No. 3 and move the vehicles as requested. The Flagman then requested that the Groundman call him via radio after the Groundman installed the second ground, so the Flagman could let the Contractor begin work.

The Apprentice Groundman and the Groundman departed the area of Five Pocket in the Groundman's vehicle and proceeded via local roads to Catenary Pole No. 349 at milepost 32.0. The Apprentice Groundman installed the second ground at Catenary Pole No. 349 at about 1 a.m. on July 18, 1997. The Groundman then informed the Flagman via radio that the ground had been installed. The Groundman walked east along Track No. 3 to the work site at Catenary Pole No. 357 A/B, milepost 32.5. The Groundman had the Foreman sign the Power Department Employee Clearance Form, MP-260.

The Groundman, Foreman, and Flagman were standing in the gage of Track No. 1, when the Flagman informed the Groundman that the work should be completed at about 3 or 4 a.m. The Flagman further informed the Groundman that he or the Foreman would contact the Groundman when the work was finished so the Groundman could remove the grounds. The Flagman then informed the Groundman and Foreman that he would be standing on the outside (south side) of Track No. 4 due to the fact that it provided the Flagman a better view of approaching trains.

The Groundman returned to Catenary Pole No. 349 where the Apprentice Groundman was waiting. The two Groundmen departed the area of Catenary Pole No. 349 in the Groundman's vehicle and returned to the Five Pocket area. The Apprentice Groundman returned to his vehicle while the Groundman remained in his vehicle and reviewed some paperwork.

At approximately 1:20 a.m. on July 18, 1997, the Flagman stopped the work and cautioned the Foreman about the boom of the crane hitting the feeder wires. The Flagman was standing in the gage of Track No. 1 when he cautioned the Foreman.

At about 1:25 a.m., a Consulting Field Engineer/Inspector for the Connecticut Department of Transportation (C-DOT) arrived at the work site to check the installation of the Catenary Pole No. 357 A/B. The Consulting Engineer was not present when the Flagman warned the Foreman about hitting the feeder wires.

Train No. 543

On July 17, 1997, the Crew for Train No. 543 reported for duty at 3:45 p.m. at Grand Central Terminal (GCT), New York, New York. The Crew comprised an Engineer, Conductor, and an Assistant Conductor. The Crew was assigned to the PM Protect Locomotive, which was used as a rescue engine in the event a breakdown of equipment occurred during the PM commission hours. The engine was then used as a work extra. The Crew reviewed the bulletin orders and

notices, then deadheaded on Train No. 1246 to New Rochelle, NY. Train No. 1246 departed GCT at 4:30 p.m. and arrived at New Rochelle at 5:05 p.m.

The Engineer made a visual check of the locomotive. He then checked the cab signal slip, air brake slip, and headlights. The Engineer took no exceptions. The Crew then conducted a test of the locomotive's air brake system and took no exceptions. The Crew stood by during the PM commission hours. Then at 7:45 p.m., the Crew departed New Rochelle in Engine No. 543 and proceeded eastward to New Haven, CT. The Crew had been instructed to retrieve Flatcar No. MNCW 1033 and transport it to Mt. Vernon Yard in Mt. Vernon, NY. Engine No. 543 arrived in New Haven Terminal, New Haven, CT at about 10 p.m. The accident occurred on MNCW's New Haven Line, at milepost 32.5.

There were four tracks aligned geographically north to south in the accident area designated as Tracks Nos. 3, 1, 2, and 4, from the west to the east. However, railroad timetable direction was east to west, with south (toward New York City), being west. For the remainder of this report, railroad timetable directions will be used. Approaching the accident site from the east, milepost 33.0, located on the west end of Stamford Station, there was tangent track for 660 feet, then a 2-degree, left-hand curve for 1,980 feet to the point of impact. The point of impact was located on the west end of the curve near the spiral to the tangent transition point. There was a 0.58 percent ascending grade from milepost 33.0 to the point of impact.

Trains operated under Traffic Control Systems Rules supplemented by Cab Signal System Rules. Tracks Nos. 3 and 1 were used primarily for westward movements and Tracks Nos. 2 and 4 were used primarily for eastward movements. An overhead catenary system was used for propulsion of trains. Maximum authorized operating speed was 60 mph for passenger trains and 40 mph for freight trains.

The sky was clear, and the temperature was 68° F.

The Accident

The Crew departed New Haven Terminal at about 12:15 a.m. on July 18, 1997, after retrieving Flatcar No. MNCW 1033. The Engineer was seated behind the controls on the right side of the locomotive. The Conductor was seated on the left side of the locomotive, and the Assistant Conductor was seated in the middle of the locomotive facing eastward. Engine No. 543 was being operated with the long hood forward.

The Contractor had finished installing Catenary Pole No. 357A/B. The C-DOT Consulting Engineer checked the level and plumb of the catenary pole. The consulting Engineer also checked the foundation bolts.

The Foreman in his interview stated that he had requested permission from the Flagman to move the vehicles eastward to the next work location at Catenary Pole 358 A/B, milepost 32.6. The

Foreman further stated in his interview that the Flagman was sitting on the foundation of the catenary pole opposite Catenary Pole 357 A/B, outside (south) of Track No. 4, and indicated to the Foreman, with a hand gesture, that he had permission to move.

At approximately 1:30 a.m., Engine No. 543 with Flatcar MNCW No. 1033 operated through the work area on Track No. 2. As Engine No. 543 approached the work area, the Engineer noticed the vehicles on Track No. 3. One of the vehicles was facing east and the other vehicle was facing west. The headlights of both vehicles were being used to help illuminate the work site. As Engine No. 543 approached the work area, the Engineer dimmed the headlight. It was shortly after this that the Flagman was struck.

The Engineer in his interview stated that he did not feel or hear anything unusual while traveling through the area. The Engineer further stated that he might have seen something reflective on the Track No. 4 side, possibly a cone. In a hearing held on Oct. 16, 1997, by MNCW, the Engineer stated that he saw the vehicles; however, he did not see anyone in the vicinity of the vehicles, and therefore did not sound the horn or ring the bell.

The Contractor moved to the next work location and started to install Catenary Pole No. 358 A/B. During the installation of the pole, the Crane Operator needed to move from the north side control platform to the south side control platform. The Crane Operator requested that the C-DOT Consulting Engineer watch for trains while the Crane Operator walked along Track No. 1 to get to the south side control platform. The C-DOT Consulting Engineer at first refused, stating that it was the Flagman's responsibility to watch for trains. The Crane Operator then informed the C-DOT Consulting Engineer that he could not find the Flagman. The C-DOT Consulting Engineer watched for approaching trains while the Crane Operator moved to the south side operating platform. This was the first time that anyone noticed that the Flagman was missing. The Contractor finished installing Catenary Pole No. 358 A/B at about 3 a.m. The Contractor Crew Members could not find the Flagman, so they moved their vehicles to the Five Pocket location.

The Crew then removed the vehicles from Track No. 3, while the Foreman informed the Groundman that they were finished and that the Groundman could remove the grounds. The Foreman then inquired whether the Groundman had seen the Flagman. The Groundman stated that he did not know where the Flagman was located. The Groundman and his Apprentice removed the first ground at Catenary Pole No. 360. They then proceeded in the Groundman's vehicle to Catenary Pole No. 349 and removed the second ground. Afterwards, the Groundmen proceeded to the Contractor's headquarters near Catenary Pole No. 349 and had the Foreman sign the Power Department Employee Clearance Form, MP-260. The Groundman and his Apprentice then returned to the Five Pocket area. The Apprentice Groundman departed the Five Pocket area in his private vehicle at about 4 a.m., and the Groundman departed in his private vehicle at about 4:30 a.m.

At 5:57 a.m. on July 18, 1997, the Conductor of Train No. 1507 reported a body in the gage of Track No. 2 at Catenary Pole 357, milepost 32.5 in Stamford, CT. The MNPD responded and found the body of the Flagman. The body was discovered about 132 feet east of Catenary Pole No. 357. The body was on its left side, head facing west and back against the south rail of Track No. 2. Severe head injury was observed, and the victim's right arm was severed at the shoulder. The victim's left foot had been severed above the ankle, and was found in the victim's boot.

An orange reflective vest was discovered on the body. A (REPCO) 2-way radio was found east of the body. The radio was in the "on" position, and the battery pack had been separated from the radio. A pack of cigarettes and individual cigarettes were found in the gage of Track No. 2.

The victim was pronounced dead by the Medical Examiner at 8:36 a.m. on July 18, 1997. The body was removed about 10 a.m. and transported to Stamford Hospital by Gallagher Funeral Home.

(Please see the attached three diagrams of Stamford Yard and the surrounding area to better visualize the accident scene and chain of events that led up to the fatality.)

Post-Accident Investigation

It was determined from the interviews conducted that the Flagman was last observed at about 1:20 a.m. on July 18, 1997.

It was further determined from the evidence at the scene that the Flagman had been standing in the gage of Track No. 2 when he was struck. A review of the train tracking reporting system disclosed that the PMMO with Locomotive No. 543 was the only train to operate on Track No. 2 at the estimated time of the accident.

Equipment

On July 18, 1997, the MNPD conducted an inspection of Locomotive No. 543 on Track No. 14 at Grand Central Terminal (GCT), New York, New York. The inspection disclosed traces of dried blood and hair fibers on the front pilot. Also, there were minute traces of fleshy matter on the wheel frame at the front of the locomotive on the Fireman's side.

A 3-man, post-accident inspection of Locomotive No. 543 was conducted on July 18, 1997. The inspection disclosed that the headlights (low and high beams) and marker lights had operated as intended on both ends of the locomotive. The horn, warning bell, and wipers all worked as intended. No safety appliance defects were noted. The post-accident inspection of the locomotive's air brake system revealed that Locomotive No. 543 was equipped with a 26-6 brake system and iron brake shoes.

The following brake applications and brake cylinder pressures were noted:

Brake Application	Brake Cylinder Pressure
Independent	44 PSI
Full Service	65 PSI
Emergency	78 PSI

The brake pipe pressure was 90 PSI and brake pipe leakage was measured at 1 PSI per minute. The main reservoir pressure was recorded to be between 138 PSI and 127 PSI. The main reservoir leakage rate was measured to be 0.5 PSI per minute. No exceptions were taken to the locomotive's air brake system. The brake rigging and piston travel were also inspected and no exceptions were taken.

The deadman feature, sanders, fireman's emergency valve, and air compressor were also examined, and no exceptions were taken.

A review of the Locomotive Inspection and Repair Record and Daily Inspection Records disclosed no exceptions.

Event Recorder No. 0089618 from Locomotive No. 543 was downloaded at GCT on July 18, 1997. The data from the event recorder was analyzed at MNCW's North White Plains Mechanical Facility, North White Plains, NY, on July 22, 1997. The analysis of the data disclosed that Locomotive No. 543 was being operated with the front end (long hood) forward. The locomotive was traveling at a speed between 20 and 31 mph. The cab signal was normal, with no change occurring. The brakes were fully charged; the penalty control switch had never been applied. The throttle was being operated consistently with the speed of the train, and the horn had not been sounded.

Work Procedures

A review of the Catenary Pole Erection Work Procedures revealed that foul time and flagging protection were required for off-track work when fouling an adjacent track or utility overhead lines. The work procedures also required that the outriggers on the crane be set and that the crane level for all hoisting operations be stabilized. From interviews conducted, it was reported that the outriggers of the crane were set only on the north side of Track No. 3.

On July 22, 1997, a review of the train sheets for the New Haven Line was conducted at GCT. The review disclosed that no foul time had been requested between CP 229 (milepost 29.0) and CP 234 (milepost 33.4) from July 13, 1997 to July 18, 1997, from 10 p.m. to 6 a.m.

Training

A review of the training records of MNCW revealed that only two of the Contractor's personnel had been trained in Roadway Worker Safety.

Sight Distance

On July 31, 1997, sight distance testing was conducted at the accident site, from midnight to 3 a.m. The weather at the time of the testing was clear and dark. The temperature was about 68° F. Locomotive No. 543 was operated at various speeds to determine the sight distance of the Engineer and Conductor to the point of impact. At 25 mph, with the headlight on dim, the Engineer had a sight distance of 216 feet to the point of impact.

The Conductor had a sight distance of 687 feet to the point of impact at 25 mph. At 25 mph (approximately 37 feet per second), the Engineer had approximately six seconds to view the Flagman and react. The Conductor had approximately 19 seconds to view the Flagman and react.

The Flagman's sight distance from the point of impact to the point where the headlight of the locomotive was first visible was 974 feet. At 25 mph, the Flagman would have had about 26 seconds to view the locomotive and clear the tracks. The illumination of the headlight on high beam would have added eight to 10 seconds to the Flagman's sight distance.

Flagging Equipment

A review of the list of items found at the accident site and in the Flagman's vehicle disclosed that the Flagman did not have a flashlight or fusees as required by Rule No. 35 of the Operating Rules of MNCW.

Medical

A review of the Flagman's medical chart by MNCW disclosed that there was no evidence of a safety or medical condition that would have prevented the victim from performing the duties of a Gang Watchman or Flagman. The review also disclosed that the victim's vision was noted to be 20/15 in both eyes, and the victim had excellent binocular vision.

The Medical Examiner stated in a telephone conservation with MNCW's police department that the strike pattern on the victim was consistent with the subject having been struck from behind.

Post-accident toxicology testing revealed that the victim's blood and urine samples tested negative for both drugs and alcohol.

The postmortem conducted on the victim determined that the cause of death was multiple blunt traumatic injuries.

Analysis

MNCW policies, practices, and procedures required the Flagman to perform several duties while flagging for the private Contractor. The Flagman was required to provide protection for himself, the private Contractor, and the trains; protect MNCW's property; and secure foul time.

According to post-accident tests conducted, the Flagman had ample time and sight distance to view the approach of Train No. 543 and clear the track area.

Corrective Action

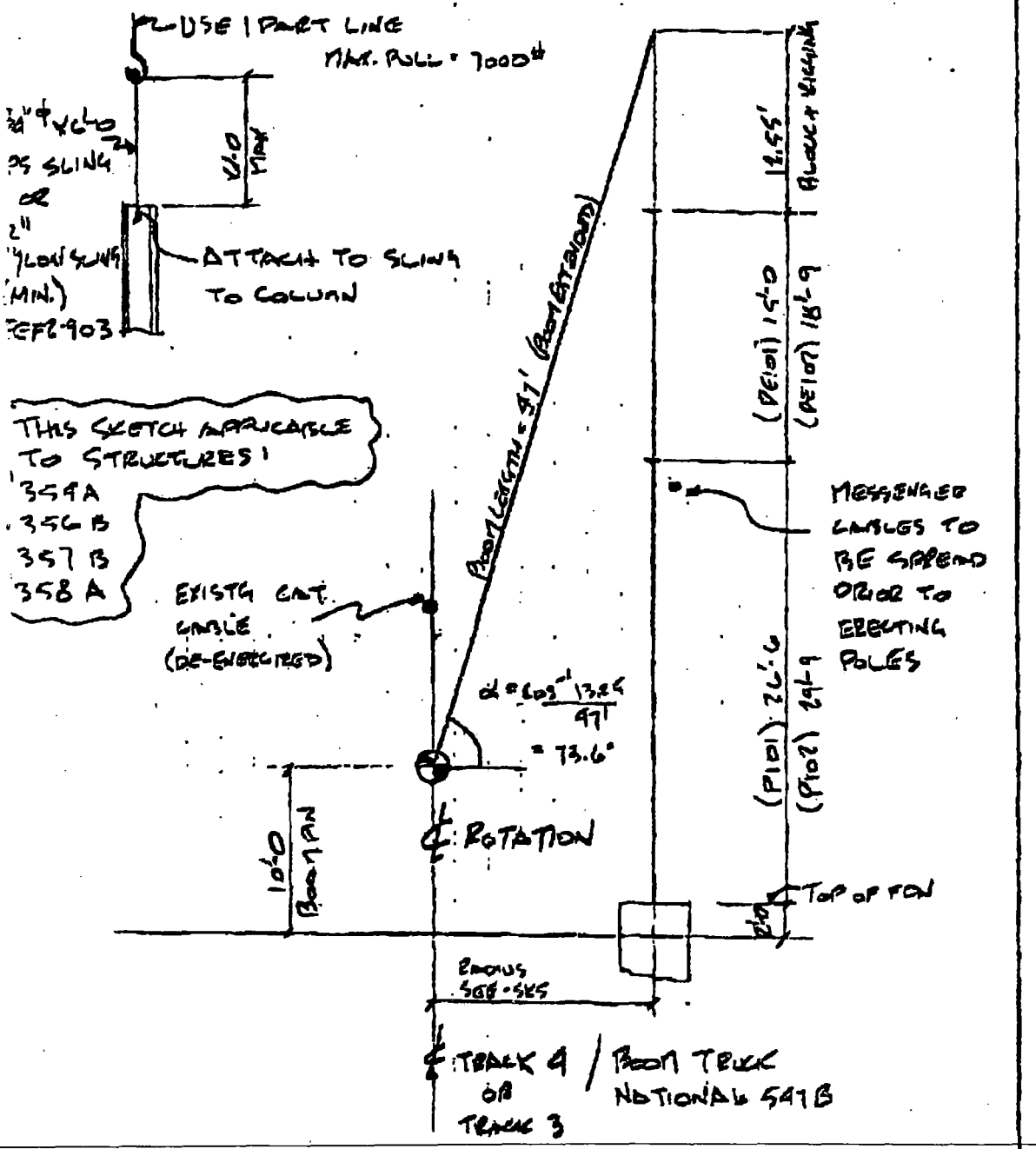
Following the investigation, MNCW took the following actions:

- Halting all work on the Stamford Center Island Platform Project and requiring all personnel to attend safety training classes before returning to work;
- Reviewing the training of personnel at other work sites and arranging safety training as needed; and
- Incorporating a new procedure that required the Groundmen to observe the Contractor while the Contractor was working near overhead lines.

W. THOMAS ZIEMAN, P.E.
500 Summer Street Suite 206
Stamford, Connecticut 06901
(203) 356-9200
FAX (203) 356-9170

JOB 65-1
SHEET NO. SK-3 OF
CALCULATED BY RCD DATE 6-25-97
CHECKED BY WTZ DATE
SCALE 1/8"=1'-0

TYPICAL CRANE ELEVATION FOR NEW POLES



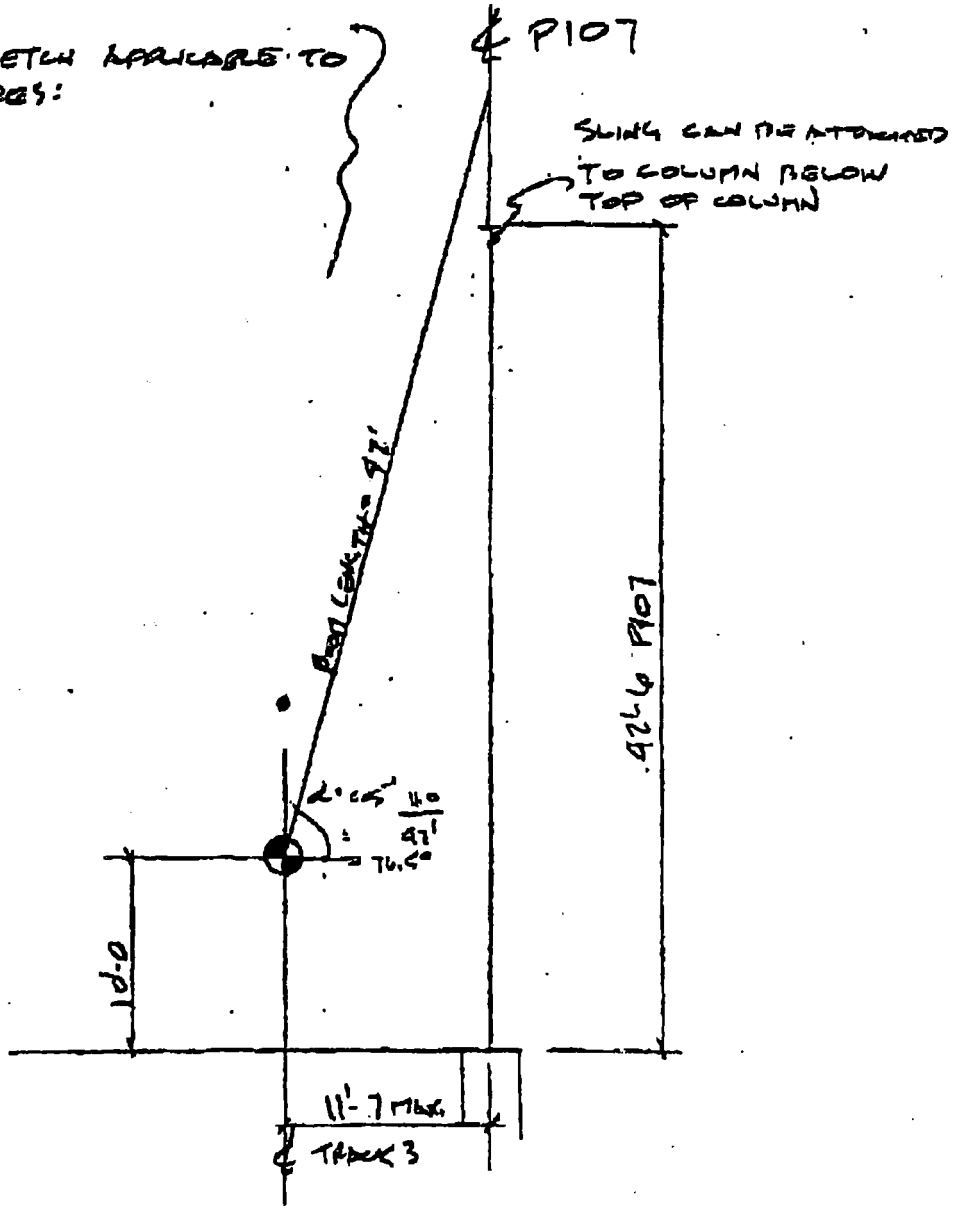
W. THOMAS ZIEMAN, P.E.
500 Summer Street Suite 206
Stamford, Connecticut 06901
(203) 356-9200
FAX (203) 356-9170

JOB 65-1
SHEET NO. SK-4 OF
CALCULATED BY ZCD DATE 6-25-97
CHECKED BY WTZ DATE
SCALE 1/8"=1'-0

TYPICAL ELEVATION FOR NEW TOWERS

THIS SKETCH APPLICABLE TO STRUCTURES:

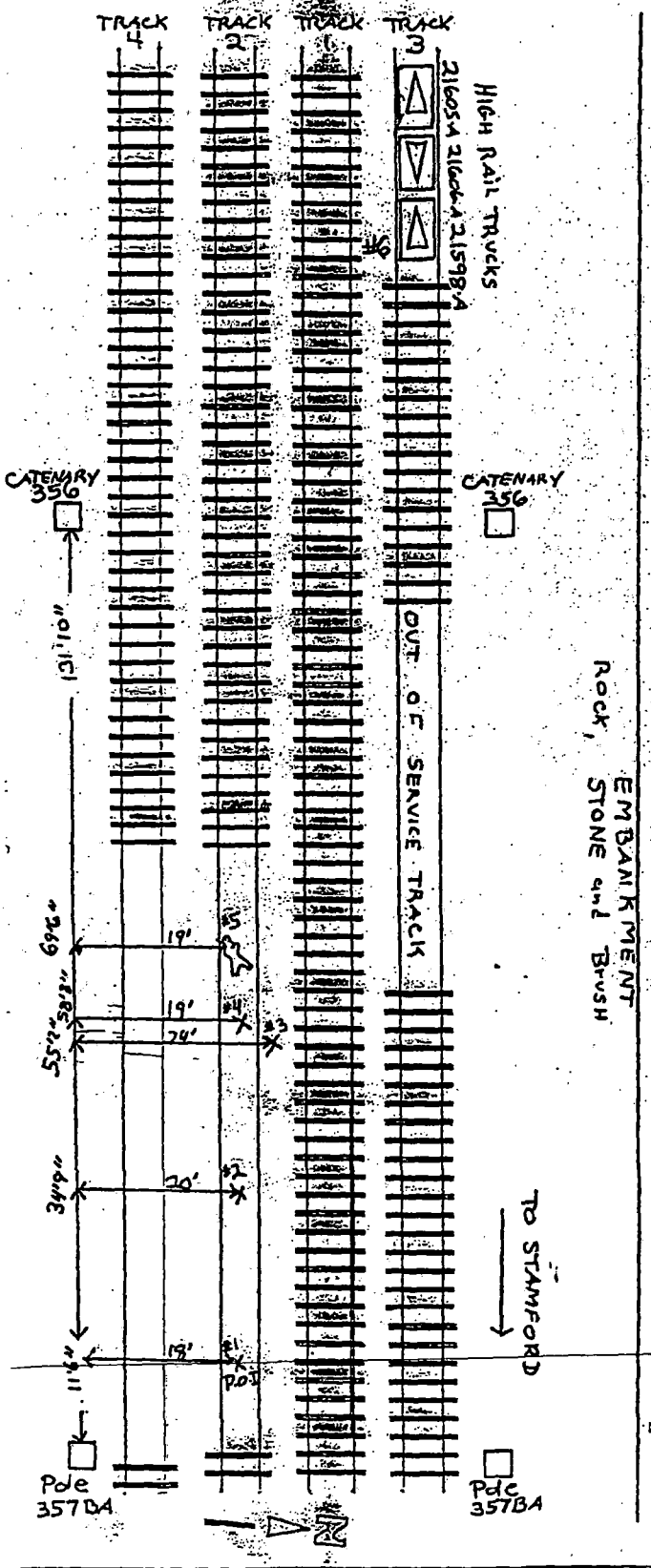
358 XA
359 XA
360 XA



PD-100-02	PD-100-15	CMD OF OCCURRENCE	INCIDENT NO.	DATE OF ORIGINAL REPORT	DATE OF THIS REPORT
XXXX		☐1 ☐2 ☒3 ☐4	97-33325	7/18/97	7/18/97

PD-100-02A (9/96)

DETAILS:



DAIGRAM KEY

#1- Point of Impact. Approx.11'6" WEST of Pole 357BA and approx. approx. 18 feet North of the track #4 SOUTH TIE end. Within the gauge of track #2.

#2- Radio battery pack within the gauge of track #2 and approx. 34'9" WEST of Pole 357BA and approx 20' NORTH of the track #4 SOUTH TIE end.

#3- Victims RIGHT arm between the track #1 and #2, approx. 55'2" WEST of Pole 357BA, and approx. 24' NORTH of the track #4 SOUTH TIE end.

#4- Upper portion of a REPCO radio approx. 58'8" WEST of Pole 357BA and approx 19 feet North of the Track #4 SOUTH TIE end, and within the gauge of track #2

#5- Body of the victim within the Gauge of track #2, and approx. 69'6" from Pole 357BA and approx. 19' NORTH of the TRACK #4 SOUTH TIE end.

#6- A RED baseball style cap located between track #1 and 3 approx 200 feet WEST of the point of impact.

A cross-over is present between tracks #2 and #1 in this area and has been deleted from this diagram.

Two additional highrail trucks are parked on track #3 to the EAST of 357BA and are not visable in this diagram.

ALL MEASUREMENTS ARE APPROX. AND THIS DIAGRAM IS NOT DRAWN TO SCALE.

DENT REPORT FOLLOW-UP PREPARED BY	SHIELD NO.	ID NO.	SIGNATURE	REFERRED TO (UNIT)
t. Thomas W. Bennett	201	108296	Sgt.	
EWING SUPERVISOR	SHIELD NO.	ID NO.	SIGNATURE	C.O.'s INITIALS
Capt. S McCabe	14	010663	Capt. S McCabe	LTS M

ORIGINAL

REPORT: FE-23-97

RAILROAD: St. Lawrence & Hudson Railway (A subsidiary of Canadian Pacific and formerly known as the Delaware and Hudson)

LOCATION: Binghamton, New York

DATE, TIME: July 24, 1997, 3:50 a.m., EST

PROBABLE CAUSE:

The Carman did not provide Blue Signal protection while working on railroad equipment to protect himself from the unexpected movement.

EMPLOYEE:	**Craft**.....	**Maintenance of Equipment**
	Activity.....	Car inspections; air brake tests; applying EOT device; and switching at the same time.
	Occupation.....	Carman
	Age.....	53 Years
	Length of Service.....	29 years, seven months
	Last Rules Training.....	March 1996
	Last Safety Training.....	January 1997

Circumstances Prior to the Accident

On Weds., July 23, 1997, a St. Lawrence & Hudson Car Inspector (Carman) reported for his regularly assigned duties working the 10 p.m. to 8 a.m. shift (10-hour shift) at the railroad's East Binghamton Yard in Binghamton. The yard's 17 tracks were geographically aligned east/west and were south of the railroad's two freight main lines which were designated from north to south as No. 2 Runner and No. 1 Runner, respectively. The railroad's timetable direction was north/south with timetable north being the west end of the yard and timetable south being the east end of the yard.

At approximately 3:15 a.m. on July 24, the Carman and a Co-Worker were informed by the on-duty Yardmaster that two tracks were ready to be used. Outbound Train 268 was waiting for an air brake test on Track No. 4, and 46 cars for outbound Train 270 were ready to be inspected on Track No. 5. After obtaining an additional end-of-train (EOT) device from the shop and placing it into the Carman's company vehicle (known as a "mule"), the two Carmen proceeded to

opposite ends of the yard. The Carman locked and flagged the east end of Track No. 5 while his Co-Worker did the same on the west end. After connecting the ground air to the end of the west car, the Co-Worker began walking eastward, inspecting the south side of the cars on Track No. 5 (Train 270) while the Carman performed the brake test on Train 268 on Track No. 4. After completing the brake test, the Carman was to join his Co-Worker and help finish inspecting the cars on Track No. 5.

At 3:35 a.m., the Co-Worker overheard the Carman's radio transmission informing the Crew Members of Train 268 that the brake test was complete and that they were "OK to depart." He noted the time in his notebook. As Train 268 began pulling westward, its departure was temporarily interrupted by a cut of cars fouling the yard's Track No. 1 switch. Continuing his inspection of Track No. 5, the Co-Worker reached the easternmost car and noticed the Carman's vehicle parked next to the No. 1 Runner.

On July 23, 1997, the Crew for East Binghamton Yard Switcher Job YBHS-66 (also known as 6R), reported for duty at 11:59 p.m. The 3-person Crew consisted of a Locomotive Engineer, Conductor, and Brakeman. At approximately 3 a.m. on July 24, the Crew received instructions to make up Train 269 on the No. 1 Runner. After performing several switching moves, during which they classified cars according to the switch list provided by the Yardmaster, the Crew Members pulled 19 cars westward out of Yard Track No. 1, leaving 14 cars in the track and fouling the switch. They then shoved the cars eastward onto the No. 1 Runner and coupled to four cars they had previously left on the west end of the track. After coupling to the standing four cars, they shoved the entire cut of 23 cars eastward to spot them at the ground air plant. After stopping, the Brakeman instructed the Engineer to pull ahead (westward), believing that the head five were to go back to Yard Track No. 1. After pulling ahead, the Conductor radioed the Brakeman, informing him that all the cars were to remain on the No. 1 Runner. The Brakeman stopped the movement and instructed the Engineer to shove back (eastward) to the original position at the ground air plant. This completed the make up of Train 269, except for the outbound power, which was still at the engine house. The Crew uncoupled the locomotives and returned to Yard Track No. 1 where they shoved the cars they had left fouling the switch into the clear, allowing Train 268 to depart the yard off Track No. 4.

The Accident

There were no eyewitnesses to the accident. It is believed that the Carman attempted to apply the EOT device to the rear of the east end car (TTAX 554144) on the No. 1 Runner prior to the completion of the switching moves being made by YBHS-66. At some point during a shoving move eastward, the Carman was evidently knocked to the ground and rolled over by the wheels of the moving equipment.

After noticing the Carman's vehicle, the Co-Worker proceeded to the No. 1 Runner and discovered the fatally injured Carman beneath the wheels of the fifth car from the east end of the train. He contacted the Yardmaster by radio. The Yardmaster then called emergency responders

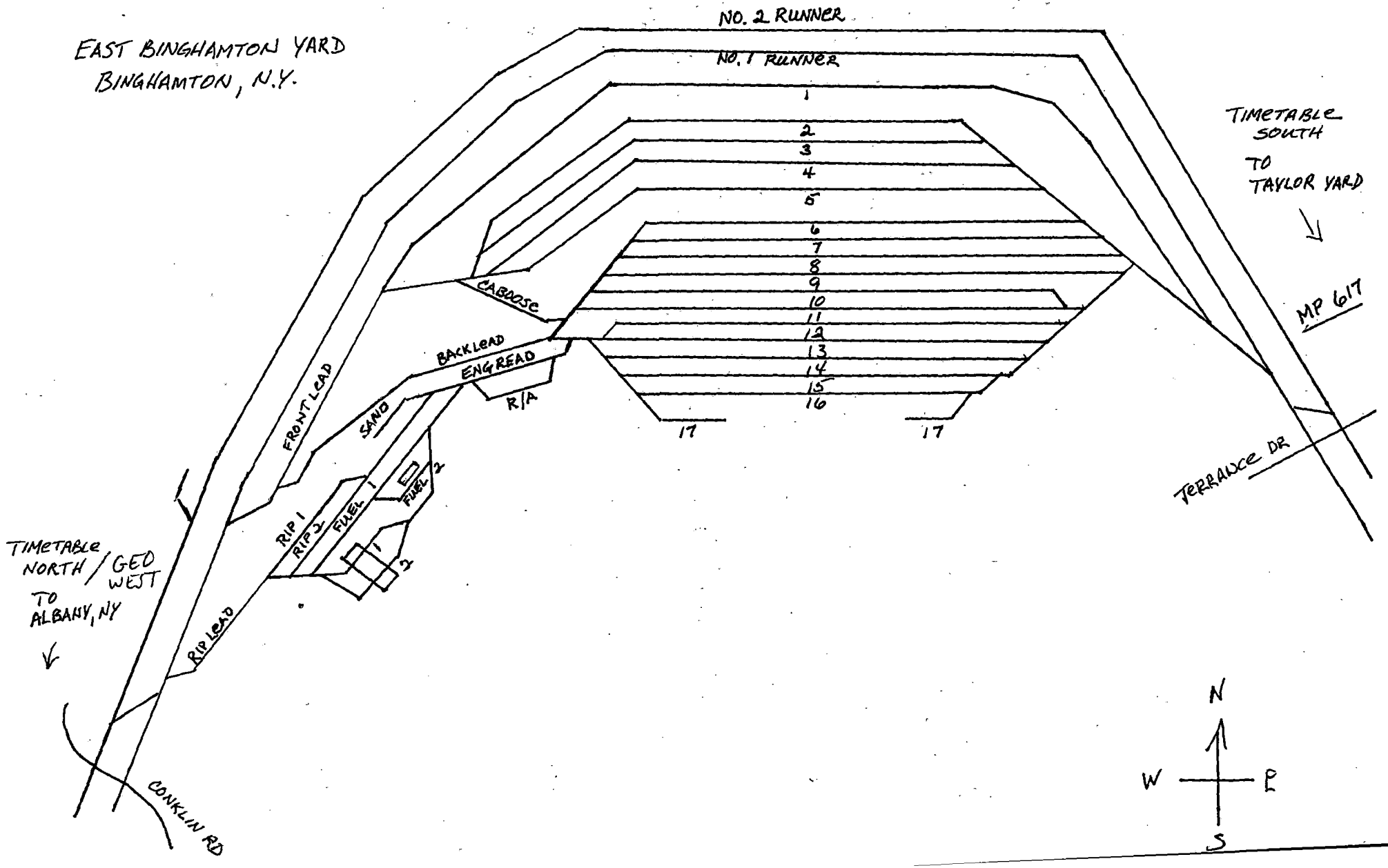
at approximately 4:17 a.m. Emergency responders included the local sheriff's department, fire department, and EMS technicians. The local Coroner pronounced the victim dead at the scene and established the time of death as 3:50 a.m. The Coroner then ordered the body transported to a local hospital for autopsy.

(Please see the attached diagram of Binghamton Yard to better visualize the accident scene and chain of events that led up to the fatality.)

Post-Accident Investigation

Post-accident interviews were conducted with individuals having direct knowledge of the accident. The involved equipment was inspected for compliance with applicable safety regulations with no conditions noted which would cause or contribute to the cause of the accident. The EOT device was found positioned on the coupler of the east end car of the train without the air hose connected. The investigation disclosed that no Blue Signals were displayed at either end of the cars on the No. 1 Runner. Documentation indicated that the Carman had received training in the proper application of Blue Signal protection in March 1995 and March 1996; however, he had been disciplined in the past for not applying the Blue Flag rule. The Carman's portable radio and flashlight were found in the vehicle and were working as intended. The YBHS-66 Crew was unaware of the presence of the Carman working on the No. 1 Runner. Results of mandatory post-accident toxicology testing of the Carman's remains were negative. Cause of death as determined by autopsy was, "Compression injury of lower thorax with multiple internal injuries."

EAST BINGHAMTON YARD
BINGHAMTON, N.Y.



REPORT: FE-25-97

RAILROAD: Union Pacific Railroad Company (UP)

LOCATION: Elko, Nevada

DATE, TIME: Aug. 15, 1997, 3:30 a.m., PST

PROBABLE CAUSE:

The Switchman entered between his consist and the 3-car cut to adjust the coupler drawhead and was pinned between the cars by the unexpected return movement of the 3-car cut.

EMPLOYEE:	**Craft**	**Transportation**
	Activity	Switching
	Occupation	Switchman
	Age	53 years
	Length of Service	28 years
	Last Rules Training	Sept. 3, 1996
	Last Safety Training	Aug. 23, 1996
	Last Physical Examination	Aug. 8, 1990

Circumstances Prior to the Accident

On Aug. 14, 1997, at 11:59 p.m. (PDT), the Switchman reported for duty on Yard Job No. YEL-52, at the UP's Elko Yard office (milepost 669). The Crew comprised an Engineer, Switch Foreman (Foreman), and Switchman. The Switchman was observed by fellow employees and appeared to be fit for duty. All three Crew Members were regularly assigned to this job and had 16 hours rest prior to going on duty. Between 11:59 p.m. and the time of the event, the Crew performed yard switching, coupling up cars on yard tracks, and making up trains.

Prior to the event, the Switchman was instructed by the Foreman to go to Track No. 11 and be ready to couple up the cars on that track after the Foreman and Engineer had completed switching on the other tracks. During this time, the Engineer and Foreman were switching cars on Tracks Nos. 6, 5, and 11.

After the Foreman and Engineer completed these moves, the Foreman contacted the Switchman by radio and asked if he was ready to stretch Track No. 11 to determine if all the cars were coupled together. The Switchman said he was ready, and the track was stretched. The Switchman then noticed that another coupling had to be made about five or six cars from the rear of the cut. The Switchman walked up and made that coupling. After discussing some switching movements over the radio, the Switchman was instructed by the Foreman to stay on Track No. 11 until the cars were coupled. Then the Switchman would walk over to Track No. 4 and make sure those cars were coupled together. The Switchman responded over the radio that it would be no problem and at that point, the Foreman turned over control of the movements to the Switchman on Track No. 11.

The Foreman walked over to check the cars in Track No. 4 against his switch list. While at Track No. 4, the Foreman realized that the Switchman was not making any moves on Track No. 11, so he tried to contact him on the radio with no response. He then contacted the Engineer, who tried to contact the Switchman with no response. At that point, the Foreman told the Engineer that he was going back to check on the Switchman. The Foreman got in a van used by the Switch Crews and drove back to Track No. 11, where he saw the Switchman's lantern lying between the rails on Track No. 11.

Weather conditions at the time of the accident included a clear, dark sky, and a temperature of 65° F.

The Accident

The Foreman found the Switchman crushed between two cars. He immediately notified the Engineer, who contacted the proper authorities. The two locomotives and 27 cars were not moving when the Switchman was found by the Foreman.

The Elko Police and Fire Departments were called and arrived on the scene at about 4:10 a.m. The Coroner, who was notified and arrived at about 5 a.m., pronounced the Switchman dead at about 5:15 a.m.

The railroad reported no damage to equipment as a result of this event.

(Please see the attached two diagrams of Elko Yard to better visualize the accident scene and chain of events that led up to the fatality.)

Post-Accident Investigation

The Switchman was familiar with this yard, having performed duties as a Conductor in the past. The Switchman had been a Conductor for over 20 years and had bid on the Switchman's job in the yard following the merger of UP and Southern Pacific Railroad. This was his second time on this particular shift in the yard.

The investigation revealed that when the coupling was attempted six cars from the rear of the cut, the last three cars, which were not coupled at the time due to misaligned couplers, rolled away freely and stopped approximately 140 feet from the Switchman's position. The Switchman then attempted to adjust the coupler on this car prior to coupling the last three cars, which had rolled away. During this time, the Switchman did not notice the 3-car cut rolling back toward his location.

Toxicological testing of the deceased was performed under the authority of 49 CFR Part 219 Subpart C, with negative results. Testing procedures by the railroad were not followed. The Crew failed to complete FRA F6180.73, failed to insure samples were collected in a timely manner, failed to make the kit immediately available, and failed to follow prescribed procedures in completing form FRA F6180.74. FRA investigators indicated they would cite violations against the carrier.

Inspection of track and equipment revealed no evidence of conditions that could have caused or contributed to the cause of the accident. The two drawbars involved in the accident indicated that they needed to be oiled and were very hard to move. The 24-hour inspection reports on both locomotives were in compliance.

The event recorder print-out for both locomotives, UP 3946 and UP 3646, indicated that the speed varied between 0 and 4 mph. The track had about ½ of 1.0 percent grade in both directions, meeting in the middle of the track. The track was clear of obstacles and provided good footing.

TO: A.J. COWELL

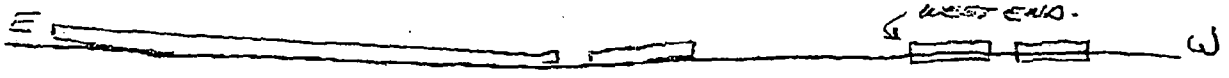
ED COMBS ARRIVED ON SITE: 0935

ELKO, NEVADA
YARD SWITCHER

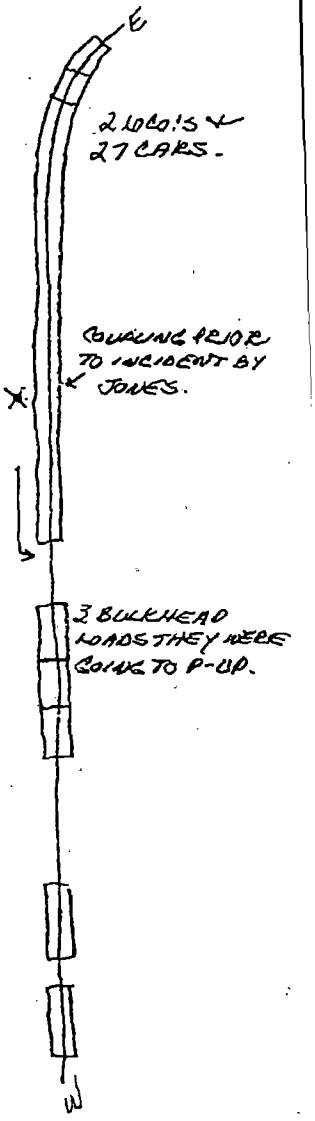
TRACK #11 SLIGHT GRADE BOTH DIRECTIONS

LOC'S & 27 CARS

CARS TIED DOWN WEST END.



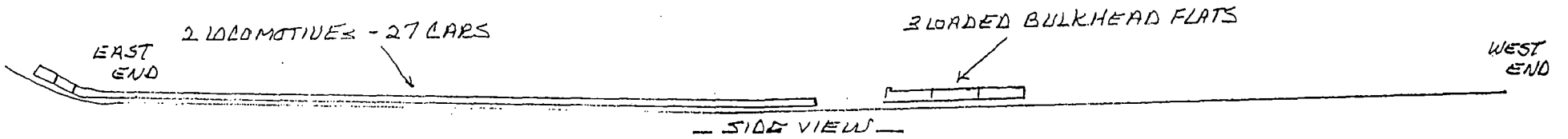
POSSIBLE CAUSE AT THIS TIME IS THAT AFTER MAKING FIRST COUPLING, JONES WALKED BACK TO REAR OF CUT & STEPPED INSIDE RAIL TO ADJUST COUPLERS. THE ASSUMPTION IS THAT WHEN MAKING THE FIRST COUPLING THE 3 BULKHEAD FLATS WERE KICKED WEST ABOUT 3 CARS ON A SLIGHT GRADE & WHEN JONES STEPPED BETWEEN RAIL THE BULKHEAD CARS ROLLED BACK EAST COUPLING JONES UP.



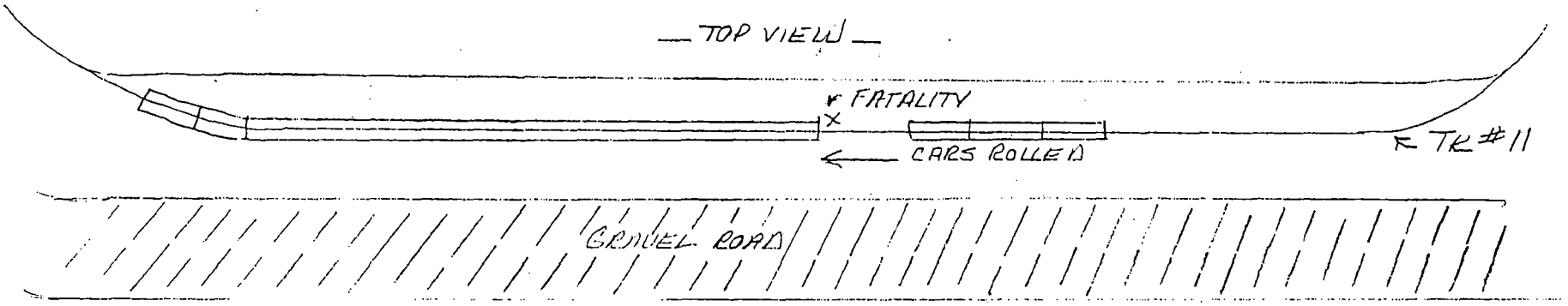
DATE: 8-15-97 TIME: 5:30 AM (PT)
WEATHER: DARK, CLEAR, 70°
JOB: YEL-52 (UP 3946-SL46) RADIO'S WORKING
TAPES SENT SLC WILL GET COPY.
REMARKS TESTED. (JAMES F. JONES - 54 YRS OLD)
OFFICER ON SCENE: NORM HOLMS, UP, MOP
MP LOCATION - 669.0 N/B BRAKE, BILL SOLASBURY
OFFICERS AT ELKO: S. LEWIS, TED LEWIS, A.J. HOLMES,
ENGR: R.D. BLACK
FOREMAN: V.W. BONER
TYPE OPERATION: GOR-6.28 TT: ST ITEM 2 #7
ADDITIONAL INFO. TO FOLLOW.

EXECUTIVE UNION
AUGUST 15, 1997

TRACK NO. 11 — 12 DEG. 0 TO GRADE BOTH WAYS



— SIDE VIEW —



— TOP VIEW —

N

REPORT:	FE 27-97	
RAILROAD:	Burlington Northern Santa Fe Railroad (BNSF)	
LOCATION:	Barstow, California	
DATE, TIME:	Sept. 12, 1997, 11:25 a.m., PST	
PROBABLE CAUSE:	Failure of the motor vehicle operator to yield the right of way to a moving cut of freight cars descending the hump.	
EMPLOYEE:	**Craft**.....	**Maintenance of Way**
	Activity.....	Repair of head-end telemetry and EOT devices, and replacement of malfunctioning radio.
	Occupation.....	Lineman & Communication Specialist
	Age.....	63 years
	Length of service.....	20 years & three months
	Last Rules Training.....	May 26, 1996
	Last Safety Training.....	May 8, 1997
	Last Physical Examination..	Pre-employment

Circumstances Prior to the Accident

On Sept. 12, 1997 at 7 a.m., the Lineman & Communication Specialist (Lineman) reported for duty at the BNSF shop in the classification (hump) yards. The first two hours of his duty were devoted to repairing head-end telemetry and end-of-train devices. At about 9 a.m., the Lineman was dispatched to the classification yard bowl track area to remove and replace a malfunctioning radio on board the Boron Local, BNSF Locomotive No. 2842. The Lineman drove his company-assigned motor vehicle into the bowl track area, located the locomotive, performed the repairs, and was en route back to the communication shop. He exited the bowl track area, but for an undetermined reason, reversed direction and was approaching an access highway-rail grade crossing within the hump area.

The weather at the time of the accident was clear, and the temperature was 100° F.

The Accident

As the motor vehicle proceeded over the crossing, it was struck by a cut of cars descending the hump. The motor vehicle was initially struck on the passenger side by Boxcar No. RBOX 32224, and was then struck two more times by Box Car No. RBOX 41131 and Tank Car No. NATX 37710. The force from the initial impact rolled the motor vehicle over and shoved it into the west side of the No. 1 retarder group. The force from the two additional impacts rammed the motor vehicle completely through the retarders, causing the vehicle to rip apart and ejecting the Lineman from the vehicle, resulting in multiple injuries to the Lineman.

The total force from the multiple impacts completely destroyed the motor vehicle and caused Boxcar No. RBOX 32224 to derail at the east side of the No. 1 retarder group. A team of Trainmen, who were assigned to monitor the speed of cars coming off the hump and were positioned in a motor vehicle about 50 feet from the No. 1 retarder group, witnessed the accident. They immediately contacted the Humpmaster, who in turn notified the Barstow Police Department. The Barstow Police and San Bernardino County Coroner's office responded to the call, and the Lineman was pronounced dead at the scene of the accident.

(Please see the attached two diagrams of the Barstow hump yard facilities to better visualize the accident scene and chain of events that led up to the fatality.)

Post-Accident Investigation

The print-out received from the Humpmaster's computer-assisted control center indicated that Boxcar No. RBOX 32224 had exited from the master retarder at a speed of 13.7 mph. At the time of impact, the car had accelerated to an estimated speed of approximately 15 mph. The increase in speed was attributed to the descending grade approaching the No. 1 retarder group.

The vehicle came to rest about 258 feet east of the initial point of impact. The Lineman was found lying face down on the northwest side of the No. 1 retarder group, about 84 feet from the point of impact. Wreckage and debris from the motor vehicle was found scattered along the entire north side of the retarder group.

Immediately after this accident, on the same day, the Division Superintendent issued Bulletin Notice No. 76 and had a warning sign installed at the north side of the road crossing.

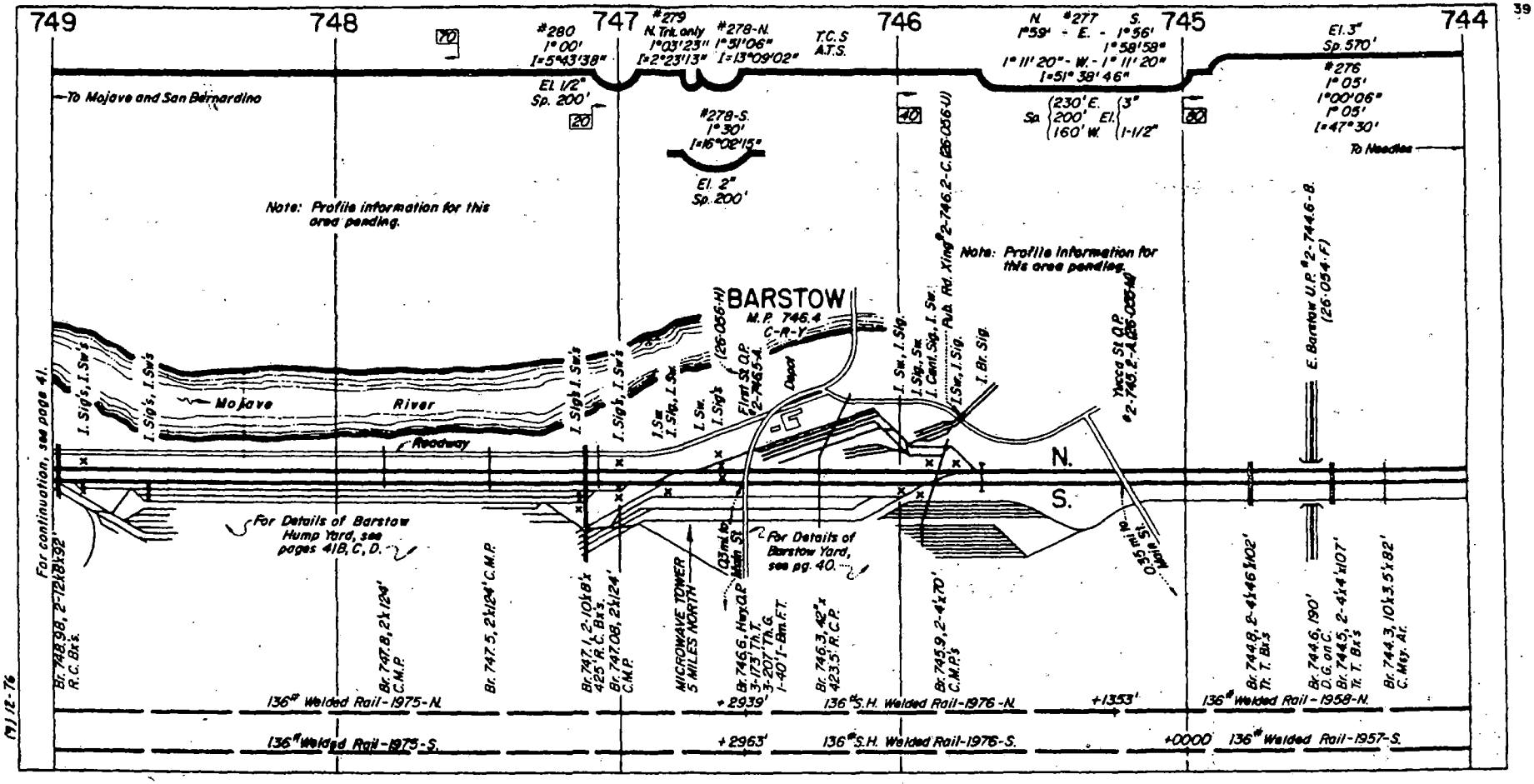
The warning sign was painted with red and black lettering on a white background and read as follows:

> **STOP, DO NOT USE THESE CROSSINGS UNTIL AUTHORIZATION HAS BEEN OBTAINED FROM THE HUMP TOWER.**

The Superintendent's bulletin notice stated that until further notice, anyone using the road crossings to gain access into the bowl track area must contact the Humpmaster for permission before crossing the tracks. In addition, the Bulletin Notice specified that the road crossings must not be occupied during humping operations.

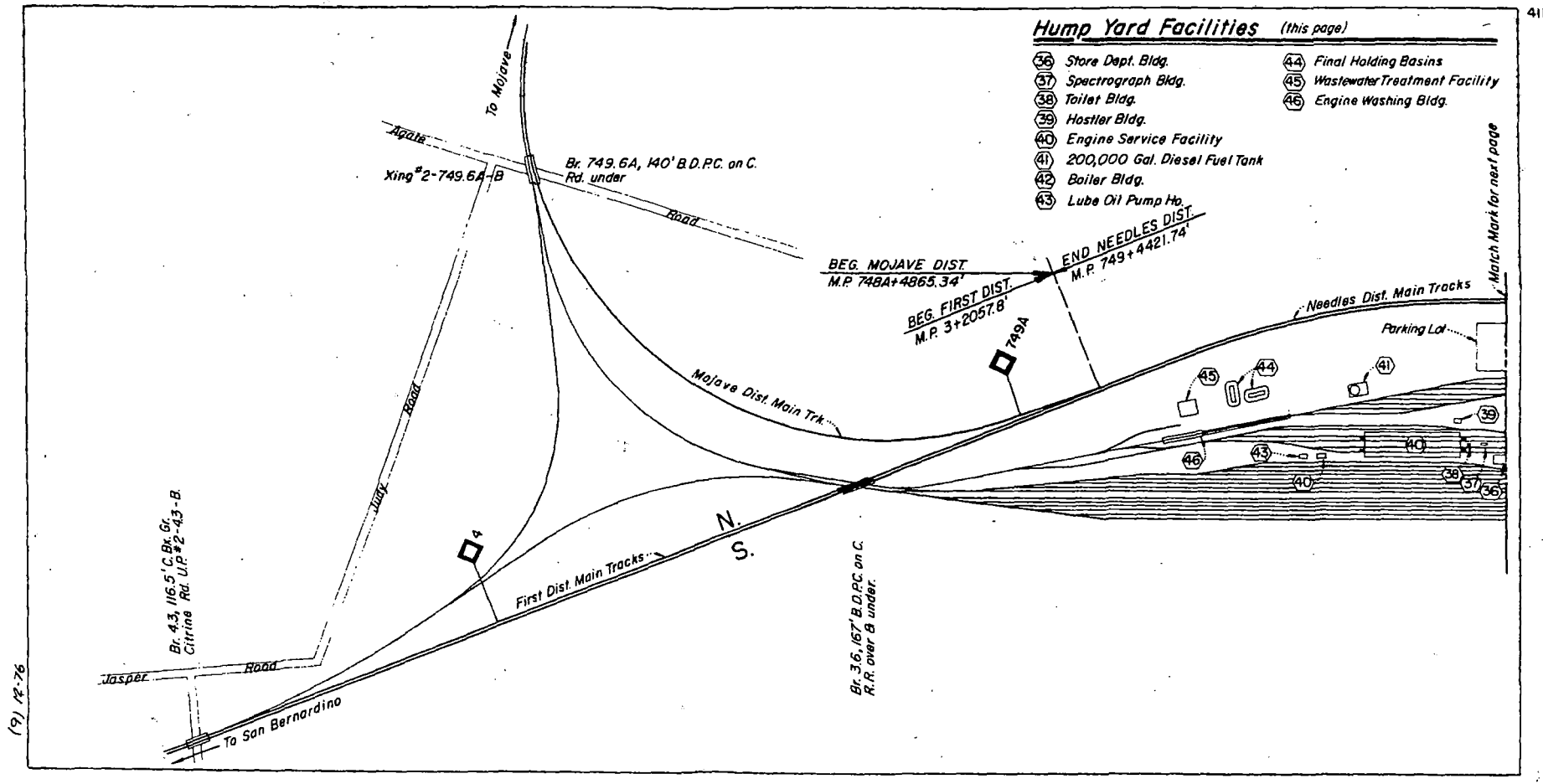
The overall length of the No. 1 retarder group was 108 feet. The distance from the initial point of impact to where Boxcar No. RBOX 32224 and the motor vehicle came to rest was about 258 feet.

Blood specimens were harvested from the deceased and mailed to NWT, Inc. for the purpose of toxicological testing under FRA authority. NWT found the vials broken upon arrival; therefore, testing was canceled. Toxicological testing reports were requested from the San Bernardino County Coroner's Office, who had taken additional specimens under its authority. The Coroner's Office released the test results, which were negative for any drugs or alcohol.



FE 27-97
ATTACHMENT
NO. 18.

(1)


Hump Yard Facilities (this page)
36 Store Dept. Bldg.
37 Spectrograph Bldg.
38 Toilet Bldg.
39 Hostler Bldg.
40 Engine Service Facility
41 200,000 Gal. Diesel Fuel Tank
42 Boiler Bldg.
43 Lube Oil Pump Ho.
44 Final Holding Basins
45 Wastewater Treatment Facility
46 Engine Washing Bldg.
To Mojave
Agate Road
Xing #2-749.6A-B
Br. 749.6A, 140' B.D.P.C. on C. Rd. under
BEG. MOJAVE DIST. M.P. 748A+4865.34'
END NEEDLES DIST. M.P. 749+4421.74'
BEG. FIRST DIST. M.P. 3+2057.8'
749A
Needles Dist. Main Tracks
Parking Lot
Match Mark for next page
Mojave Dist. Main Trk.
Judy Road
Br. 4.3, 116.5' C. Bk. Gr. Citrine Rd. U.P. #2-43-B.
Jasper Road
First Dist. Main Tracks
N.
S.
Br. 3.6, 167' B.D.P.C. on C. R.R. over B under.
To San Bernardino
(9) 12-76

REPORT: FE-30-97

RAILROAD: Norfolk Southern Railway (NS)

LOCATION: Chicago, Illinois

DATE, TIME: Oct. 7, 1997, 2:13 p.m., CST

PROBABLE CAUSE:

The Motor Vehicle Operator did not yield the right-of-way to the oncoming Metra train at a private highway-rail grade crossing.

EMPLOYEE:	**Craft**.....	**Other (Not Contractor)**
	Activity.....	Patrolling NS property and responding to call of possible trespasser
	Occupation.....	Railroad Special Agent
	Age.....	56 years
	Length of Service.....	24 years
	Last Rules Training.....	Aug. 6, 1997
	Last Safety Training.....	Aug. 6, 1997
	Last Physical Examination.....	Jan. 15, 1997

Circumstances Prior to the Accident

Norfolk Southern Special Agent

The Norfolk Southern (NS) Special Agent reported for duty at 7 a.m. at the NS Police Office at NS Landers Yard. His assignment was to patrol and provide police protection for NS property, its employees, and goods in transit. He was operating police vehicle no. 396018, a 1996 Chevrolet Lumina, while performing his duties. His tour of duty was scheduled to end at 3 p.m.

At 2:10 p.m., the Special Agent received a radio message from the Conductor on NS Freight Train No. 268, reporting a trespasser on his train. When the Special Agent received the call, he was on Columbus Drive at Kedzie Avenue, approximately one half mile west of the private entrance for Landers Yard. After receiving the call, he proceeded eastward on Columbus Drive

toward the private entrance for the yard. Columbus Drive was immediately north of and parallel to Metra's single main track. The northern boundary for Landers Yard was parallel to and south of the main track. The private entrance and grade crossing provided passage across Metra's main track for vehicles entering and exiting the yard. Visibility for drivers in motor vehicles approaching the private entrance from the west was unobstructed.

Metra Commuter Train No. 7

On Oct. 7, 1997, after receiving the statutory off-duty period, the Crew for Metra Commuter Train No. 7 reported for duty at 179th Street in Orland Park, IL at 5:04 a.m. The Crew comprised an Engineer, Conductor, and Assistant Conductor. The equipment for Train No. 7 comprised one Model F40-PH diesel electric locomotive, NIRC 124, and seven passenger cars.

Using this equipment, the Crew completed one and a half round trips between Chicago, IL and Orland Park, IL. The accident occurred during the return leg of the second round trip. The Crew departed Chicago's Union Station at 1:45 p.m. for its final westbound trip of the day destined for Orland Park, IL.

Approaching the accident site, the main track passed through Forest Hill Interlocking with a restricted speed of 30 mph. West of the interlocking, authorized track speed increased to 50 mph at milepost 9.8, which is 5,280 feet east of the Landers Yard private grade crossing. For a distance of 700 feet, there was no physical obstruction limiting the Engineer's view of the railroad's right-of-way.

After proceeding through Forest Hill Interlocking, the Engineer increased train speed to approximately 40 to 45 mph. Westbound Metra Commuter Train No. 7 approached the NS private crossing at a recorded speed of 43 mph. The Engineer was seated on the right side of the control cab. He first noticed a white automobile when the train was about 138 feet from the crossing. The Engineer sounded the locomotive whistle, providing 11 seconds reaction time for the motorist. The strobe light was on; the crossing warning (ditch) lights were on; and the head light was on bright.

At the time of the accident, the sky was clear, and the temperature was 86° F.

The Accident

The Locomotive Engineer sounded the whistle to warn the driver, but the automobile driver did not stop before pulling onto the track. The automobile, driven by an NS Special Agent, was traveling northbound on Columbus Street in the right lane as it approached the entrance for the Landers Yard private crossing. The driver was responding to a call concerning a trespasser suspected of attempting to board NS Freight Train No. 268, which was being assembled. When the automobile reached the private entrance for Landers Yard, the driver made a right turn into the entrance and proceeded onto the crossing and into the path of the oncoming train.

When the Engineer realized that the vehicle was not going to stop, he initiated an emergency application of the train's air brakes. The locomotive struck the automobile on its left side. The impact caused the automobile to spin around, flip over, and come to rest at the south curb on Columbus Avenue, 31 feet north of the track and 37 feet west of the crossing. The body of the driver was ejected from the automobile and came to rest on the pavement in the eastbound lanes of Columbus Avenue. The train came to a stop 1,106 feet west of the impact point.

(Please see the attached two diagrams of Landers Yard to better visualize the accident scene and chain of events that led up to the fatality.)

Post-Accident Investigation

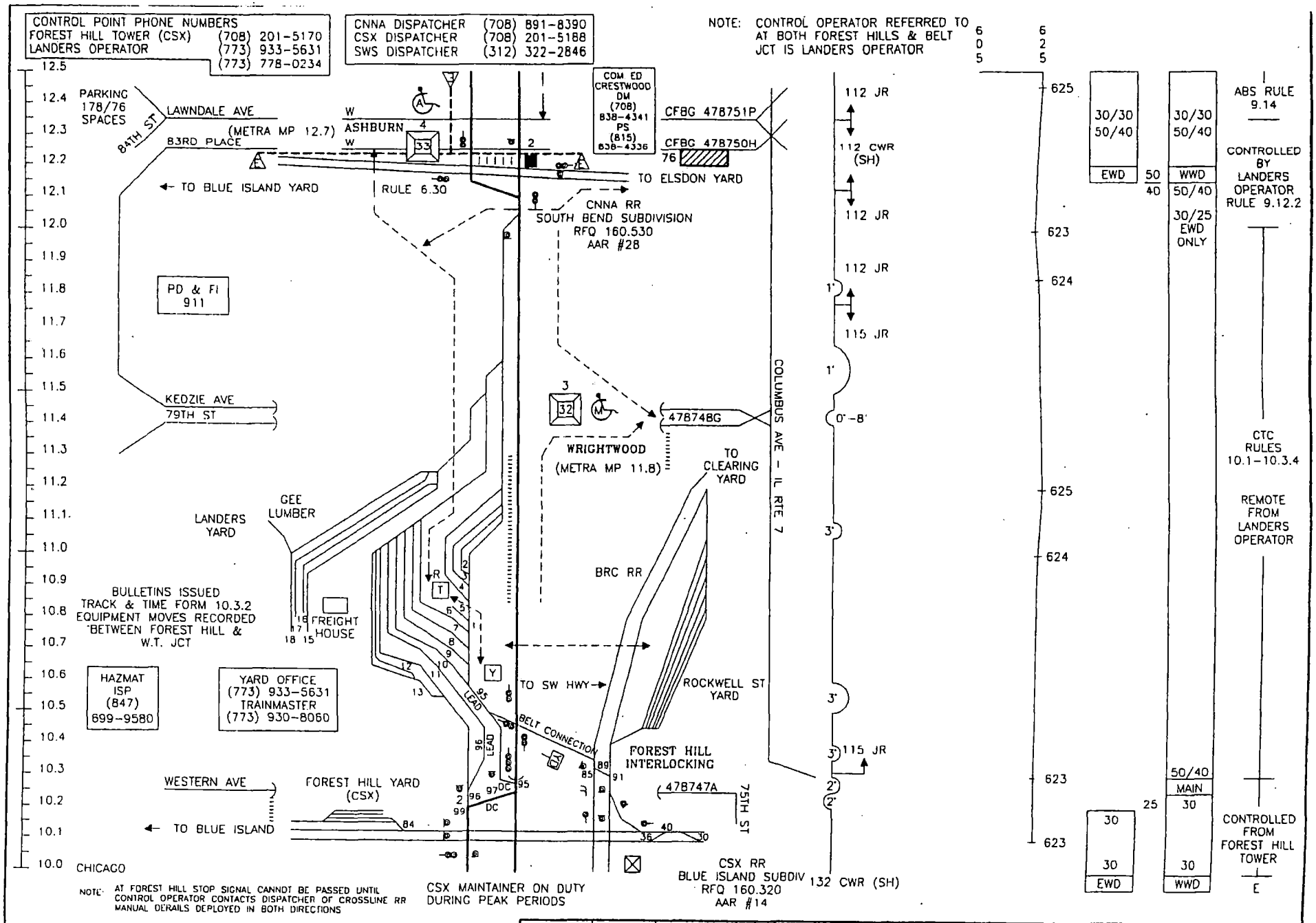
Chicago Department Ambulance No. 27 transported the driver of the automobile to Christ Hospital and Medical Center in Oak Lawn, Illinois, where he was pronounced dead at 2:42 p.m. Death was caused by multiple injuries. Toxicological tests performed on the Special Agent were negative.

Investigators found light crushing damage to the right front pilot of the locomotive. The right uncoupling lever handle was smashed, and the right sill step for the cab door ladder was bent inward and fouling against the truck. There was no other visible equipment damage.

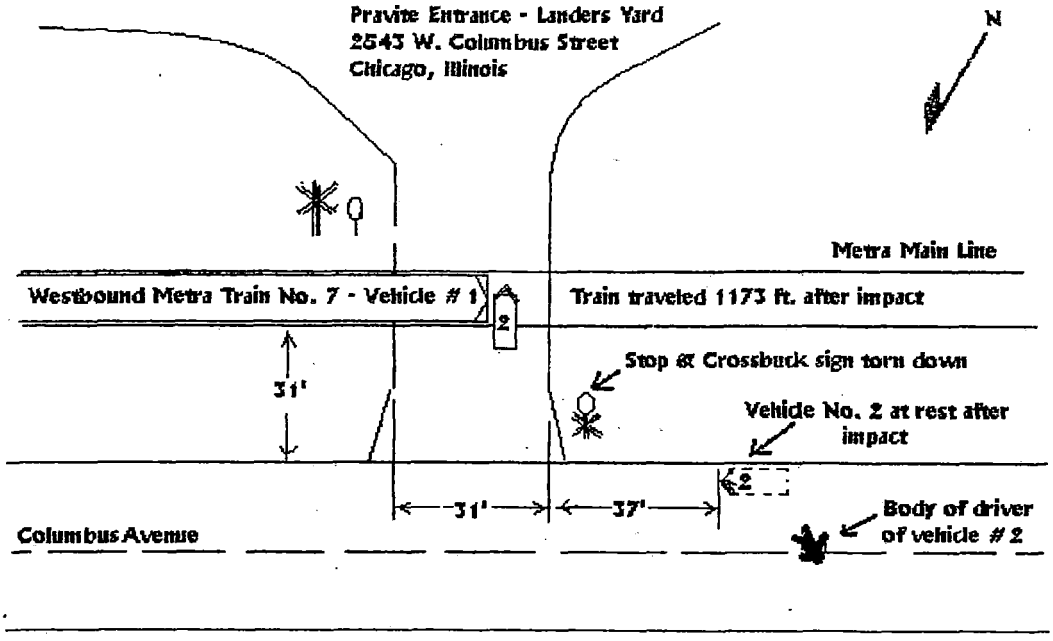
There was no track damage. The train's impact caused the automobile to be thrown against the warning and stop signs at the northwest corner of the grade crossing, pulling the signs out of the ground.

An inspection of the interior of the vehicle confirmed that the driver's seat belt was in the locked position and the seat back was collapsed onto the rear seat. The impact apparently had forced the driver to the rear. As the seat reclined backward, he slid backward and upward. The momentum of the vehicle caused the driver to be ejected through the left rear door window.

The automobile was damaged beyond repair. A review of the maintenance records on the automobile indicated the vehicle had been maintained in accordance with departmental standards. A complete (front and rear) brake job had been performed on July 10, 1997.


CONTROL POINT PHONE NUMBERS
FOREST HILL TOWER (CSX) (708) 201-5170
LANDERS OPERATOR (773) 933-5631
(773) 778-0234
CNNA DISPATCHER (708) 891-8390
CSX DISPATCHER (708) 201-5188
SWS DISPATCHER (312) 322-2846
NOTE: CONTROL OPERATOR REFERRED TO AT BOTH FOREST HILLS & BELT JCT IS LANDERS OPERATOR
COM ED CRESTWOOD DM (708) 838-4341 PS (815) 838-4336
PARKING 178/76 SPACES
84TH ST
LAWNDALE AVE
(METRA MP 12.7)
83RD PLACE
ASHBURN
TO BLUE ISLAND YARD
RULE 6.30
TO ELSDON YARD
CFBG 478751P
CFBG 478750H
CNNA RR
SOUTH BEND SUBDIVISION
RFQ 160.530
AAR #28
PD & FI
911
KEDZIE AVE
79TH ST
478748G
WRIGHTWOOD
(METRA MP 11.8)
TO CLEARING YARD
COLUMBUS AVE - IL RTE 7
LANDERS YARD
GEE LUMBER
BULLETINS ISSUED
TRACK & TIME FORM 10.3.2
EQUIPMENT MOVES RECORDED
BETWEEN FOREST HILL &
W.T. JCT
FREIGHT HOUSE
BRC RR
HAZMAT
ISP
(847)
699-9580
YARD OFFICE
(773) 933-5631
TRAINMASTER
(773) 930-8060
TO SW HWY
ROCKWELL ST YARD
LEAD
BELT CONNECTION
FOREST HILL INTERLOCKING
WESTERN AVE
FOREST HILL YARD
(CSX)
TO BLUE ISLAND
478747A
75TH ST
CHICAGO
CSX MAINTAINER ON DUTY
DURING PEAK PERIODS
CSX RR
BLUE ISLAND SUBDIV
RFQ 160.320
AAR #14
132 CWR (SH)
112 JR
112 CWR (SH)
115 JR
ABS RULE 9.14
CONTROLLED BY LANDERS OPERATOR RULE 9.12.2
CTC RULES 10.1-10.3.4
REMOTE FROM LANDERS OPERATOR
CONTROLLED FROM FOREST HILL TOWER
EWD
WWD
MAIN
30/30
50/40
30/25 EWD ONLY
NOTE: AT FOREST HILL STOP SIGNAL CANNOT BE PASSED UNTIL CONTROL OPERATOR CONTACTS DISPATCHER OF CROSSLINE RR MANUAL DERAILS DEPLOYED IN BOTH DIRECTIONS

FARE ZONE C



Grade Crossing Accident
Chicago, Illinois
October 7, 1997
FE-30-97

REPORT: FE-31-97

RAILROAD: National Railroad Passenger Corporation (ATK)

LOCATION: Concord, Massachusetts

DATE, TIME: Oct. 10, 1997; 12:01 p.m., EST

PROBABLE CAUSE: The Track Crew used a procedure not provided for in the carrier's operating or safety rules to foul the track.

POSSIBLE CONTRIBUTING FACTOR:

The incomplete communication between the Track Foreman and the Inspection Foreman holding the movement authority on the affected track.

EMPLOYEE:

Craft..... MOW

Activity..... Track maintenance: adding rubber panels to the east edge of a highway-rail grade crossing.

Occupation..... Machine Operator

Age..... 51 years

Length of Service..... 27 years

Last Rules Training..... May 20, 1997

Last Safety Training..... March 25, 1997

Last Physical Examination..... No Record

Circumstances Prior to the Accident

Location Description

The accident occurred at milepost 20.0 on Track No. 1 of the Fitchburg Route Main Line in Concord, MA. There were two tracks at milepost 20.0 numbered 1 and 2, north to south. Both were signaled for traffic in one direction (NORAC Rule 251) as established by ATK New England Division Commuter Lines Timetable Number 7, effective July 28, 1997. The normal direction of traffic was westbound on Track No. 1 and eastbound on Track No. 2. The maximum

authorized speed for passenger trains on the Fitchburg Route Main Line was 60 mph. There was a permanent speed restriction of 40 mph between milepost 19.80 and milepost 20.30 on Track No. 1.

ATK provides commuter rail service under contract to the Massachusetts Bay Transportation Authority on the Fitchburg Route Main Line.

Track Maintenance Crew

On Oct. 10, 1997, an ATK Track Crew reported for duty at 7:30 a.m. at Fitchburg Yard, Fitchburg, MA. The Crew comprised a Foreman, Machine Operator, and a Trackman. Normally, this Crew had two additional Laborers, who were absent on the day of the accident.

When the Track Foreman had talked with the Roadmaster-In-Charge at approximately 7:30 a.m. by telephone, he received instructions to add rubber panels to the east edge of the Sudbury Road highway-rail grade crossing in Concord. The panels were being installed because the town of Concord was improving the sidewalk along the east edge of Sudbury Road in the vicinity of the crossing.

After discussing the work activities to be performed, the Track Foreman and Laborer departed for Concord. The Machine Operator departed independently to deliver a roadway maintenance machine to the site on a flatbed trailer truck. The machine was a "Swingmaster," a payloader-like device used in many types of work activities. The Swingmaster has various attachments, including a digging bucket and forks, which were used in this sequence at the work site.

The Track Foreman was under the impression that an ATK Construction Supervisor was to meet him at the site for additional instructions. Upon arrival at the site, the Track Foreman did not see a railroad Construction Supervisor. The Track Foreman, however, found at the site a Civil Engineer, employed by the town of Concord, who discussed the details of the project.

After discussing the project with the town Engineer, the Track Foreman contacted the Waltham, MA Tower Train Director by radio to obtain foul time. The Train Director, after authorization from the Boston West Train Dispatcher, issued foul time on both tracks at Concord at approximately 10:35 a.m. The Track Foreman initiated the radio communication on ATK Road Channel 2. Due to congestion on this channel, the Waltham Tower Train Director and Track Foreman switched to Engineering Channel 6. All radio communication from this point forward between the Track Foreman and Train Director occurred on Engineering Channel 6, which was not recorded.

At approximately 11 a.m., the foul time was released to allow eastbound trains to operate through the area on Track No. 2. At the same time, foul time was re-issued to the Track Foreman to continue work on Track No. 1. At approximately 11:33 a.m., the Track Foreman relinquished

the foul time on Track No. 1. At this point, the Swingmaster was clear of the track, and the Swingmaster Operator replaced the digging bucket on the machine with forks.

Inspection and Repair Foreman and Assistant

An Inspection and Repair (I&R) Foreman and an Assistant reported for duty at West Concord, MA at 7:30 a.m. The I&R Foreman called the Roadmaster and discussed the itinerary for the day, which was to inspect the Fitchburg Route Main Line from Somerville, MA to South Acton, MA. They departed West Concord and drove by highway to Somerville.

The I&R Foreman and his Assistant began their hi-rail track inspection (patrol) in Somerville and upon arrival at Waltham (milepost 9.90), they cleared their hi-rail pickup truck off the main track by operating it onto the Bemis Industrial Track.

Both the I&R Foreman and his Assistant departed the truck at approximately 11:30 a.m. and walked up into the tower to obtain a movement authority (Form D) to continue patrolling west beyond Waltham. At 11:47 a.m., the I&R Foreman had obtained a movement authority directly from the Waltham Tower Operator by physically visiting the structure. The authority was a Form D issued by the Boston West Train Dispatcher and delivered to the I&R Foreman via the Waltham Tower Train Director. The movement authority included line two information for operation in the westward direction between Waltham and South Acton. The authority also included line three information that indicated Train 421 (Engine 1028) was ahead.

While in the tower, the I&R Foreman briefly discussed the work activity occurring at milepost 20.0. According to various statements, the I&R Foreman indicated to the Waltham Tower Train Director that it was acceptable for the Foreman working at Concord to "work with him up country."

After the passage of Train 421, the I&R Foreman and his Assistant departed the tower and returned to their vehicle. The vehicle was operated back into Waltham Interlocking by verbal permission from the Waltham Tower Train Director. The patrol vehicle cleared west of Waltham Interlocking onto Track No. 1 at approximately 11:50 a.m.

Waltham Tower Train Director

After having received the required statutory off-duty period, the Train Director and a Trainee began their tour of duty at 7 a.m. at Waltham Tower (milepost 9.9) in Waltham. The Train Director communicated with the Boston West Train Dispatcher throughout the morning by block line phone and relayed foul time via radio to the Track Foreman who was working at Sudbury Road (milepost 20.0). The Student Operator, under the direct supervision of the regular Train Director, manipulated the Waltham Tower control devices throughout the morning.

At approximately 11:35 a.m., the Student Train Director departed Waltham Tower to take a lunch break. Subsequent to that time, the Train Director conducted all activities in Waltham Tower.

Train 421

After having received the required statutory off-duty period, the Crew of the passenger train, comprising an Engineer, Conductor, and Assistant Conductor, reported for duty at Fitchburg, MA at 4:55 a.m. on Oct. 10, 1997. Prior to changing the train's number from 420 to 421, the Crew had operated one eastbound train into Boston, MA and one round trip between Boston and South Acton.

Train 421, operating in push/pull service, comprised a diesel electric locomotive on the front of the train (Engine 1028), five coaches (Nos. 1600, 1606, 1613, 355, and 504), and a cab control car (No. 1650) on the rear.

Train 421 originated in North Boston Station at 11:20 a.m., and the Crew took no exceptions to the equipment at any time prior to the accident.

Train 421 passed Waltham Interlocking at 11:41 p.m.

Weather conditions included a clear sky and a temperature of 70° F.

The Accident

At approximately 11:50 a.m., the Waltham Tower Train Director initiated a radio call to the Track Foreman at Sudbury Road on Engineering Channel 6. The Tower Operator, according to his statements, informed the Track Foreman that it was acceptable to *work with the I&R Foreman* holding the movement authority on Track No. 1 to foul that track. The Track Foreman at Sudbury Road, according to his statements, understood that this communication implied that it was acceptable to immediately foul the track. There was no direct communication or relay between the I&R Foreman and the Foreman at Sudbury Road. The I&R Foreman, while patrolling west on Track No. 1, was monitoring Road Channel 2 during this period.

During this period, the Roadmaster in charge of the Work Crew arrived at the site. The Roadmaster got out of his truck and told the Track Foreman that the Train Director was calling him on the radio. After this point, the Roadmaster was out of his vehicle; he did not hear the subsequent communication between the Track Foreman and Train Director about using the I&R Foreman's movement authority to foul Track No. 1. At approximately 11:52 a.m., the Track Foreman at Sudbury Road directed the Swingmaster Operator to foul Track No. 1 to install new crossing panels.

As Train 421 entered the beginning of the curve at milepost 19.80, the Engineer had already initiated a service reduction of the train brake to reduce the train speed to the required civil speed of 40 mph at milepost 19.80 and in anticipation of making a scheduled stop at Concord station at milepost 20.10. As the train entered the curve and the Swingmaster came into view, approximately 735 feet from the point of impact, the Engineer began sounding the locomotive horn. He then placed the locomotive automatic brake valve into the emergency position.

Based on subsequent analysis of the locomotive event recorder information, the brake valve was placed into the emergency position 404 feet east of the point of impact at a speed of approximately 43 mph, giving the Operator approximately five seconds to respond. The speed of the train at the point of impact was approximately 30 mph.

At the crossing, the Track Foreman, Track Laborer, and the Roadmaster heard and saw Train 421 approaching. The personnel on the ground shouted to the Swingmaster Operator to jump off of the machine. All personnel on the ground cleared the track prior to impact. At 12:01 p.m., Train 421 struck the Swingmaster, which was shoved down the track approximately 172 feet and thrown across Track No. 2. Train 421 stopped 335 feet west of the point of impact, which was approximately 400 feet east of the point where the locomotive otherwise would have been positioned for a regular stop at Concord station.

The Engineer of Train 421 initiated an emergency radio call immediately after the impact, and he informed the Train Dispatcher of the situation. The Train Dispatcher contacted a Boston and Maine Railroad extra freight train, which was located west of the area and operating eastbound on Track No. 2. The freight train was brought to a safe stop approximately one mile west of the accident site.

The ATK employees at the site attempted to assist the Machine Operator. The Roadmaster called for local medical assistance immediately after it was determined that the Operator had been crushed under the operating compartment of the Swingmaster. At 2:07 p.m., the local Medical Examiner pronounced the Swingmaster Operator dead at the scene.

The I&R Foreman was in the vicinity of milepost 12 when the accident occurred and he heard the radio emergency communications originating from the accident site. The Train Dispatcher contacted the I&R Foreman and directed him to clear the track in Lincoln, MA (Milepost 16.7).

(Please see the attached diagrams of the Fitchburg Route Main Line in Concord, Massachusetts, to better visualize the accident scene and the chain of events that led up to the fatality.)

Post-Accident Investigation

Post-Accident Toxicological Test

Post-accident toxicological tests under FRA authority were performed on the Train Crew (Engineer, Conductor, and Assistant Conductor), Train Director, Train Director Trainee, Boston West Train Dispatcher, and the deceased Swingmaster Operator. The Track Foreman at Sudbury Road, the I&R Foreman, and the Assistant I&R Foreman were tested under ATK's authority. The results of the post-accident toxicological tests for all individuals were negative for drugs and alcohol.

Sudbury Road Highway-Rail Grade Crossing

Sudbury Road was a 2-lane municipal thoroughfare extending through the central commercial area of Concord. Active warning devices at the crossing included flashing lights and gates. Due to a local whistle ban ordinance, engine whistles were not sounded in either direction approaching the crossing, unless an emergency situation occurred. The crossing surface was constructed with full depth rubber panels.

ATK conducted a test of the relays of the automatic warning devices associated with Sudbury Road on the day of the accident and again on Oct. 11, 1997. No exceptions were noted. Witness statements by motorists in the area confirmed that warning devices were functioning at the time of the accident.

Track Characteristics

Track No. 1 in the vicinity of the accident comprised 115 RE jointed rail. The geometry in the vicinity of the accident included a 3-degree, 20-minute curve to the left as viewed from the operating compartment of a westbound train. The sight distance was determined to be 725 feet in advance of the point of impact. There was a 0.66 percent sustained descending grade for 1.2 miles that westbound trains negotiated while approaching milepost 20.

Train 421 Equipment

The lead locomotive of Train 421 at the time of the accident was a 3000 horsepower, F40 PHM diesel-electric type manufactured by the Electromotive Division of General Motors in 1991. The locomotive suffered virtually no damage as a result of the collision.

The railroad reported that the maintenance history of Locomotive 1028 indicated no problems. The railroad gave special attention to defects that could have affected braking effort and warning devices. No exceptions were noted.

The event recorder on Locomotive 1028 was found to be out of calibration which resulted in deviations from the actual speed. For example, when a speed of 60 mph appeared on the speedometer, the speed event recorder showed 69 mph, while the actual speed was 66 mph. When a speed of 40 mph appeared on the speedometer, the speed event recorder showed 47 mph, and the actual speed was 45 mph.

Because of the problems with the event recorder of Engine 1028, data from the control car event recorder at the rear of the train were also obtained to provide additional information for the post-accident analysis.

Swingmaster

The machine used at the accident site was a Swingmaster Model 181. The machine was a device similar to a payloader with a rotating arm that could be used with various attachments. Swingmaster Corporation, located in Elmhurst, Illinois, manufactured the Model 181. The unit involved in the accident was assigned the number T47944 and weighed approximately 23,000 pounds.

The Swingmaster had retractable steel rail wheels that enabled it to travel on the track or highway. On the day of the accident, the Swingmaster was not placed directly on the rails. It was positioned with its rubber tires straddling the rails of the track.

In documents obtained from the railroad, it was revealed that Swingmaster T47944 had a few minor mechanical defects. However, none of the defects were severe enough to make it necessary to remove the machine from service. In addition, the defects did not have any bearing on the accident.

As a result of the collision with Train 421, Swingmaster T47944 received significant damage. The damage to the unit consisted of the following:

- Left and right doors missing;
- Rear frame severely twisted;
- Engine pushed forward and to the right;
- External damage to the cab, with the internal part of the cab intact;
- Front and both rear windows smashed; and
- The backrest of the Operator's seat bent back and sticking out of the cab by five inches.

At the time of the accident, the Swingmaster was facing west while straddling the rails of Track No. 1. The train struck the machine in the rear, and it was shoved down the track, then thrown across Track No. 2. When it came to a rest, the machine was on its side approximately 180 degrees from its original position and was fouling Track No. 2.

ATK documents indicated that the Swingmaster Operator was not using the seat belts. They were found latched at the rear of the seat. ATK documents further indicated that seat belts were not used because they bothered the Operator when the machine was traveling. This was due to the limited shock absorbing capability of the seat assembly.

ATK also noted that the Operator may have been delayed in departing the machine due to the configuration of the seat. A seat with armrests was installed in Swingmaster T47944. The Operator had to lift the armrests to depart the cab, which may have increased the time it took the Operator to attempt to depart the cab of the machine upon the approach of Train 421.

Communication Procedures

As determined by interviews with personnel associated with the accident, the critical radio communications immediately prior to the accident occurred on Engineering Channel 6. This was confirmed by the lack of recorded radio conversation between the Track Foreman at Sudbury Road and the Waltham Tower Train Director.

An ATK memorandum dated March 8, 1990 stated that "All information governing permission to use track (foul time, movements via signal indication within interlockings, and form "D" permits) will be issued on the Road Radio Channel." This memorandum listed various operational locations, including Waltham Tower, as places where the document was posted.

Communication Equipment

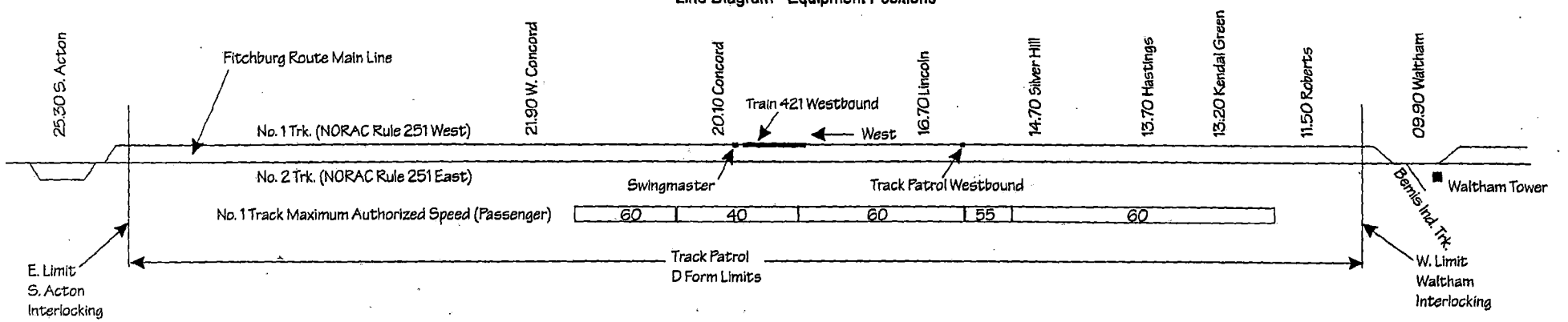
ATK conducted tests of radio equipment at the following locations associated with the accident:

- Locomotive 1020;
- Swingmaster T47944;
- Hi-rail pickup 27383 (I&R patrol);
- Pickup truck (with the capacity for six people); and
- Waltham Tower.

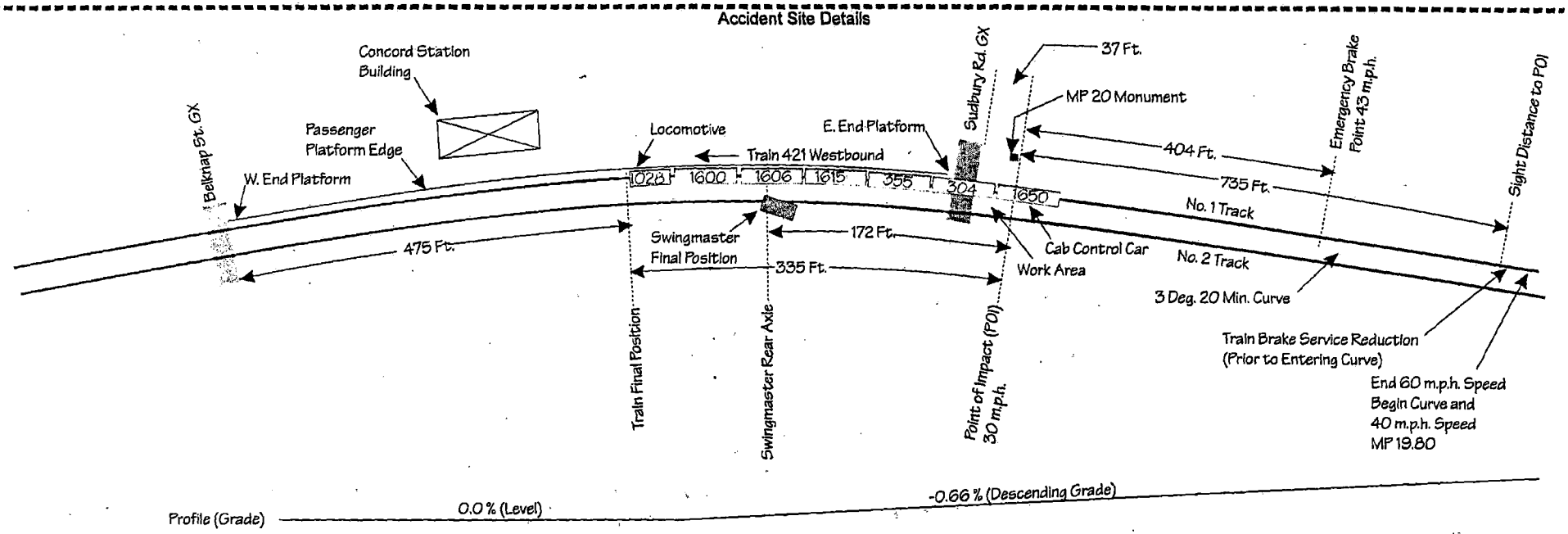
Tests of the above equipment included analysis of 2-way transmission on the Road Channel 2 and Engineering Channel 6. No exceptions were taken as the equipment met or exceeded the manufacturer's performance specifications.

FE-31

Line Diagram - Equipment Positions



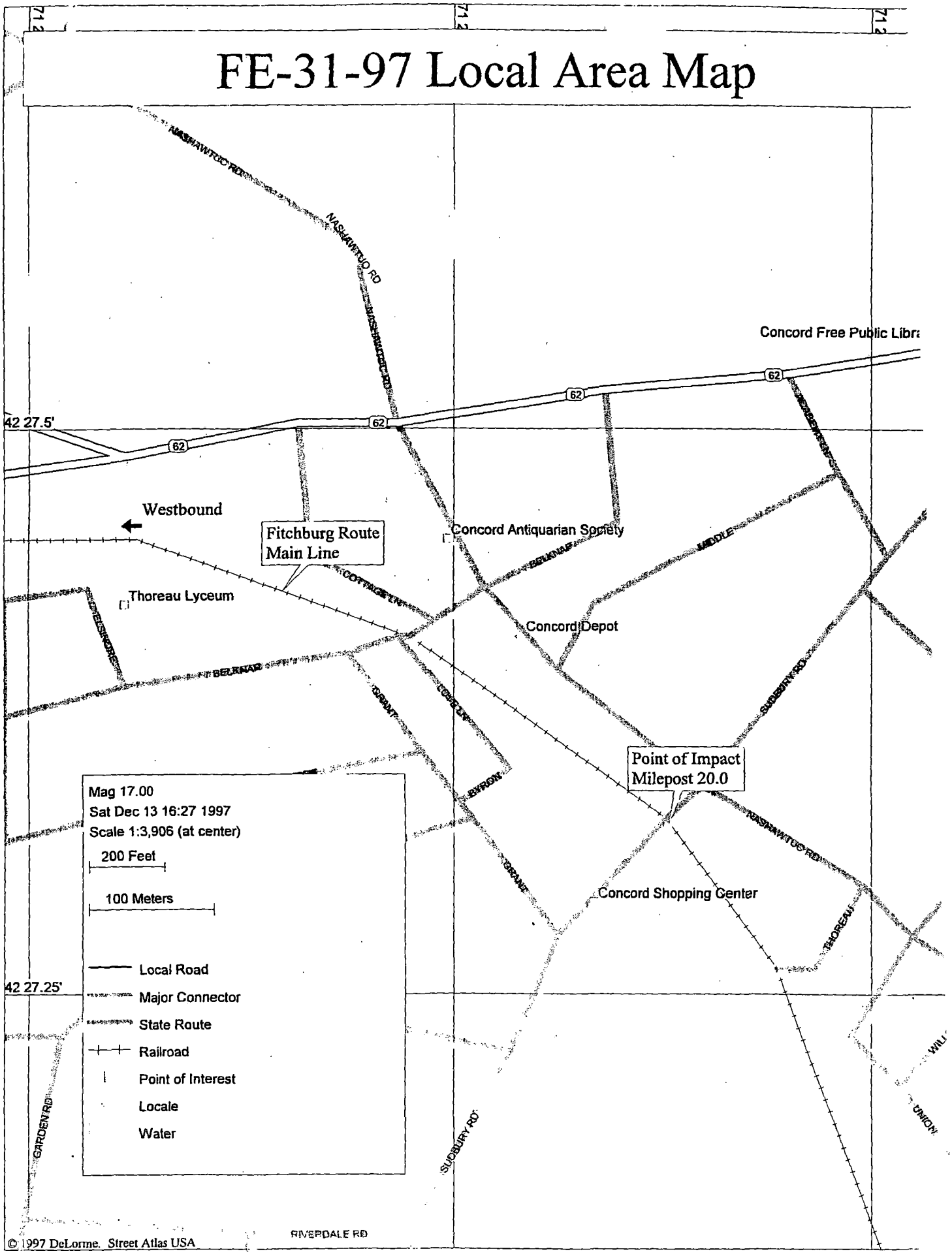
Accident Site Details



FEDERAL RAILROAD ADMINISTRATION
ACCIDENT FE-31-97
CONCORD, MA 10/10/97 12:01 P.M.
NOT TO SCALE

N

FE-31-97 Local Area Map



REPORT: FE-32-97

RAILROAD: Montana Rail Link (MRL)

LOCATION: Laurel, Montana

DATE, TIME: Oct. 16, 1997, 10:20 p.m., MST

PROBABLE CAUSE:

The Switchman unexpectedly fell from the end of the car onto the track structure while applying a handbrake during a shoving movement.

EMPLOYEE:	**Craft**	**Transportation**
	Activity	Switching
	Occupation	Switchman
	Age	22 years
	Length of Service	10 months
	Last Rules Training	April 15, 1997
	Last Safety Training	Sept. 19, 1997
	Last Physical Exam	April 15, 1997

Circumstances Prior to the Accident

Following a required off-duty period, a Switch Crew consisting of a Locomotive Engineer, Switch Foreman, and Switchman reported for duty at the Montana Rail Link (MRL) Yard office, in the Laurel, Montana train yard at 4 p.m. on Oct. 16, 1997. The Switch Crew was assigned to perform switching duties in the yard. The Switchman was observed by fellow employees to be fit for duty.

The method of operation for Laurel Yard was other than main track. In the accident area, traveling east, the track gradient descended at 0.3 percent. The train traversed a left-hand number nine turnout onto Track No. 212, which, when later inspected, was found to be free of defects such as track mis-alignment, excessive crosslevel, and broken rails. The Laurel train yard was lighted by high intensity flood lights mounted on poles.

The sky was dark, and the weather was clear and windy, with 17 mph winds out of the southwest. The temperature was 63° F.

The Accident

At approximately 10:20 p.m., the Switch Crew, using Locomotive MRL 13, was making switching moves within the Laurel Yard. The locomotive was shoving 41 cars east onto Track No. 212. The Switch Foreman and Switchman were located on the south side of the cars so as to be located on the same side and in view of the Engineer operating the locomotive.

As the locomotive neared the clearance point of the switch located at the west end of Track No. 212, the Switch Foreman boarded the second car from the locomotive, and the Switchman was observed by the Switch Foreman boarding the car directly next to the locomotive, a covered hopper car (CNIS 368784). They were to apply handbrakes on both cars. The locomotive continued to shove the cars east, moving at an estimated speed of 1 to 2 mph. After applying the handbrake, the Switch Foreman dismounted the second car to the south side and walked west toward the locomotive. He did not see the Switchman dismount the first car. However, as he was walking toward the locomotive, he saw movement between the first and second car and believed he saw the leading wheels of the first car pass over the Switchman. The Switch Foreman signaled the Engineer to stop, and the locomotive and cars stopped within one car length. The Switchman was found lying on the north rail between the end of the first car and the locomotive. It was determined that both ends of the first car had passed over the Switchman.

The Switch Foreman called for an ambulance and attempted to resuscitate the Switchman until the emergency response personnel arrived. Laurel Police and the Yellowstone County Deputy Coroner arrived at approximately 10:50 p.m. and pronounced the Switchman dead at 10:53 p.m.

Post-Accident Investigation

The deceased Switchman, Engineer, and Switch Foreman received toxicological testing under the authority of 49 CFR Part 219, Subpart C. Results were negative.

The autopsy report stated that death was caused by severe blunt force injuries sustained in a railroad accident. The footwear the Switchman was wearing was examined, and nothing was found that could have caused or contributed to the cause of the accident.

The car on which the Switchman was riding was inspected by FRA and MRL mechanical department personnel. The handbrake on the car was found to be in proper operating condition and had been fully applied by the Switchman.

FRA inspectors took exception to the brake step on the handbrake (B) end of the car. Proper measurement for this brake step was 63 inches in length and 8 inches in width. This brake step was measured and found to be 63 inches in length; however, the width of the brake step was found to have a graduating bend inward up to 2 inches in the area directly below the handbrake assembly. The graduated bend area extended for approximately 30 inches. This condition would have caused the surface area of the platform to have a decreased area for footing directly beneath

the handbrake. Since no one actually observed the Switchman fall from the end of the car, it is unknown if the condition of the platform caused the Switchman to fall.

The MRL did not charge the deceased employee with any safety rule violation.

REPORT: FE-33-97

RAILROAD: National Railroad Passenger Corporation (ATK)

LOCATION: Darby, Pennsylvania

DATE, TIME: Nov. 4, 1997, 11:32 a.m., EST

PROBABLE CAUSE:

The Watchman did not remain clear of the track.

POSSIBLE CONTRIBUTING FACTOR:

Alcohol found in the blood and urine samples of the Watchman resulting from FRA Mandatory Post-Accident Toxicology Testing could have been a contributing factor.

EMPLOYEE:

Craft	**Maintenance of Way**
Activity	Installing and replacing inter-track fencing between two main tracks.
Occupation	Carpenter, Structures
Age	45 years
Length of Service	20 years, 10 months
Last Rules Training	Aug. 16, 1996
Last Safety Training	Jan. 17, 1997
Last Physical Examination	N/A

Circumstances Prior to the Accident

On Nov. 4, 1997, ATK B & B Gang Nos. C312 and C102 reported for duty at Wilmington Terminal in Wilmington, DE at 7 a.m. At approximately 8:15 a.m., both Gangs arrived at Curtis Park Station in Darby, PA, along ATK's Northeast Corridor, Mid-Atlantic Division at MP 6.8, to install and replace inter-track fencing between Main Tracks Nos. 2 and 3. Upon arrival, a job briefing was held at 8:50 a.m., and work assignments were given by the B&B Foreman for Gang C102, who because of seniority was in charge of the project. The B&B Foreman for Gang C312 was designated to obtain on-track protection. Watchmen were placed on both the north and south ends of Curtis Park Station, one in advance on the south end, three

on the north end. Gang Watchmen's duties had been rotated on a volunteer basis. In addition, advance whistle boards were posted at milepost 7.0 and 6.0 respectively.

The area comprised four main tracks for high-speed passenger trains. Between Curtis Park and Darby Stations, the trackage curved toward the right. Track No. 4 was a 1-degree to 1-degree, 12-minute compound curve with a 3-inch designated elevation. The outermost west track, its right-of-way dropped off to a steep embankment. Permanent curvature speed restrictions were posted with a maximum allowable speed of 70 mph on Tracks Nos. 1 and 4, 80 mph on Track No. 2, and 90 mph on Track No. 3.

The standard track movement was directional south to north on Tracks Nos. 1 and 2, and north to south on Tracks Nos. 3 and 4. Local businesses such as car repair facilities and shopping stores were located near the area, but did not impose any additional environmental noise hazards.

Train movements were governed by a Traffic Control System (TCS) signalled for traffic in both directions on all tracks. Movements were controlled by the Dispatcher at ATK CETC in Philadelphia, PA, and supplemented by an Automatic Train Control system on board the locomotives.

In accordance with ATK's CETC dispatcher's log, ATK and the Southeastern Pennsylvania Transportation Authority (SEPTA) commuter rail service operated a combined total of 15 trains between the hours of 9:30 a.m. and 11:33 a.m. past Curtis Park Station without incident. Statements from the Engineers of those trains who were contacted following the accident revealed no exceptions to the way protection was provided nor any irregularities among any of the Watchmen.

The Gang Watchman was stationed at Curtis Park on the east side of Track No. 1. An advance Watchman was about three catenary poles north of the Gang Watchman on the west side of Track No. 4; and the third northernmost advance Watchman was stationed approximately four catenary poles north of the second Watchman, also on the west side of Track No. 4. A Watchman's post was situated near this area of the right-of-way for the safe observation of trains.

The B&B Foreman for Gang C312 had obtained on-track protection (foul time) for Tracks Nos. 1 and 2 on two different occasions prior to 10:33 a.m. At that time, a Maintenance-of-Way Foreman located at Penn Interlocking obtained Form D Permit No. A1405 from the ATK CETC dispatcher to take Track No. 1 out of service between Phil Interlocking and Baldwin Interlocking for right-of-way cleanup south of Curtis Park Station. Upon notification by the CETC dispatcher of the change in operations on Track No. 1 at 10:41 a.m., the B&B Foreman for Gang C312 informed the Gang and the Gang Watchman; however, he did not inform the southernmost Watchman and the two northernmost advance Watchmen that Track No. 1 would be out of service. Subsequently, on-track permission (two in total) was obtained by the B&B Foreman for Gang C312 for Track No. 2 only with the last released to CETC at 11:13 a.m. for the approach of

ATK Passenger Train No. 20, a daily train en route northbound from Washington, DC to New York on Track No. 2.

SEPTA Passenger Train No. 4634 entered the block at Baldwin Interlocking at 11:12 a.m. It was routed northbound onto Track No. 4 due to Track No. 1 being out-of-service and had seven additional stops to make before it's arrival at Curtis Park Station. The train consisted of four multiple-unit, electrically propelled locomotives (MU), with No. 139 in the lead, and Nos. 140, 355, and 354 following in sequence. The Engineer was located at the controls, and the Conductor was in the passenger compartment of the lead car.

At 11:26 a.m., ATK Train No. 20 entered the block at Baldwin Interlocking and continued northbound on Track No. 2. The Gang was alerted of the approach of ATK Train No. 20 by the southernmost advanced Watchman who blew his air horn and raised his disk. The other Watchmen followed in succession, raising their disks and blowing their air horns, until all had cleared the tracks for its passage. As SEPTA Train No. 4634 arrived and stopped at Curtis Park Station on Track No. 4 at approximately 11:30 a.m., ATK Train No. 20 passed.

When ATK Train No. 20 cleared the work area without incident, the Gang remained clear and the Watchmen's disk remained raised because the SEPTA train was still in the station. In his statement, the Engineer of ATK Train No. 20 indicated the northernmost Watchman glanced upward toward his locomotive compartment as the train proceeded through the area and held his disk raised in the same manner as the others in acknowledgment of his passage. The Engineer stated he noted no discrepancies during that operation.

The weather conditions at the time of the accident comprised calm winds and overcast skies with good visibility, limited only by line of sight. The temperature was 56° F.

The Accident

Upon departure from the Curtis Park Station at 11:32 a.m., SEPTA Train No. 4634 progressed onto Track No. 4. Statements from the Foreman-in-Charge, other Watchmen, and Gang Members verified that the train's ditch lights were on and flashing, its headlight was brightly illuminated, and the Engineer was sounding the horn. As the train rounded the curve, the Engineer noted the northernmost Watchman along the right-of-way of Track No. 4 and sounded his horn several times. The Engineer stated that the Watchman's disk was raised in the air, giving him the impression that he heard the train whistle and was acknowledging the train's approach. The Engineer then realized the Watchman was within the envelope (foul limits) of the trackage, had his back toward the oncoming train, and was not moving to clear. The Engineer stated he then placed the throttle in idle while continuing to sound his horn, applied an initial 5-pound brake reduction, and two seconds later, placed the train into emergency braking.

The northernmost Watchman was struck by the left front step portion of MU No. 139, the lead unit of SEPTA Train No. 4634, at approximately 11:32 a.m. at milepost 6.3. The Engineer of

SEPTA Train No. 4634 immediately notified ATK CETC that he thought he had struck someone and requested police and emergency medical assistance.

In accordance with SEPTA's event recorder tapes retrieved from SEPTA Train No. 4634, the speed at impact was 57 mph. The train came to a complete stop 1,044 feet from the point at which the emergency brakes were applied.

The Watchman's body was found approximately 83.8 feet from the estimated point of impact and 73 feet down the steep embankment along the right-of-way of Track No. 4. An employee of a nearby company witnessed the accident and was also the first to reach the body. He stated that he also asked his co-workers to call 911 for emergency response. Darby Police and Medical Emergency Response Personnel arrived at the scene at 11:36 a.m. The Watchman was pronounced dead at the scene at 11:45 a.m. by the MFH-EMS medic.

(Please see the attached diagrams of the Curtis Park Station and ATK's main line route discussed in the report, to visualize the accident scene and chain of events that led up to the fatality.)

Post-Accident Investigation

The installation of the inter-track fencing between Tracks Nos. 2 and 3 between Curtis Park and Darby Stations was a proposed 2-week project. The B&B Gangs began their initial work on Thursday, Oct. 30, 1997, three days prior to the accident date.

However, it was revealed that the actual on-track working time was very limited due to the inability to secure sufficient on-track protection (foul time) and equipment problems while on location. In all, it was estimated that 12 on-track working hours were performed during this period.

As previously stated, the B&B Foreman for Gang C102, the Foreman-in-Charge, gave the initial job briefing at the beginning of the work day on Nov. 4, 1997. Our investigation found that this Foreman was not the person designated to provide on-track protection; therefore, he should not have performed the job briefing. As specified in 49 CFR Part 214.315 (d) of the Roadway Worker Protection standards, the job briefing duties should have been those of the B&B Foreman for Gang C312, who was designated to provide the on-track protection. A job briefing documentation sheet listing all pertinent information covered during the job briefing was signed by each employee each day while assigned to that location, except for the Foreman-in-Charge on the day of the accident. This sheet also listed the B&B Foreman for Gang C312 as the person designated to provide on-track protection. It was also revealed that the Foreman-in-Charge was not qualified on the physical characteristics of the area; however, the Foreman for Gang C312 was qualified on the physical characteristics of the area. Statements made by the employees and the job briefing documentation sheets uncovered conflicting information regarding specific topics discussed during the job briefing such as train speeds, the Northeast Operating Rules

Advisory Committee's (NORAC) Rule 261 which governed train operations in this area, and the possibility of 2-way traffic on each track. Rule 261 states that signal indication will be the authority for a train to operate in either direction on the same track. However, having worked in the area on previous occasions, the employees stated they knew and understood the operations.

The ATK CETC train dispatcher's logs indicated trains had operated under normal standard movements since the project had started on Oct. 30, 1997. During the morning of November 4, the B&B Foreman for Gang C312 had requested, secured, and released on-track protection on two different occasions for Tracks Nos. 1 and 2 prior to the Dispatcher notifying him that an MOW Foreman at Penn Interlocking had taken the main track (Track No. 1) out of service for right-of-way track cleanup at 10:33 a.m. At that time, the B&B Foreman for Gang C312 only informed the first north Watchman stationed at the work location and Gang members.

The southernmost and the two northernmost Watchmen were not informed of the change in operations. Thereafter, the B&B Foreman for Gang C312 secured and released on-track protection two additional times for Track No. 2, the last released at 11:13 a.m. for the approach of ATK Train No. 20 entering the block at Baldwin northbound on Track No. 2.

Inquiries disclosed that SEPTA Train No. 4634 was the first northbound move of the day and while the B&B Gangs were present since the job started on Oct. 30, 1997 on Track No. 4. In addition, because the move was made necessary by Track No. 1 being out of service for the first time since the project began, it was also the first time two northbound trains had occupied the block simultaneously. Interviews held after the accident divulged that although the Gang members were aware of NORAC's Rule 261, some were still surprised to see SEPTA Train No. 4634 approaching northbound on Track No. 4. Moreover, the northernmost Watchman was in possession of a hand-held radio; however, it was not used for protection purposes but for notification of breaks and lunch periods. It was also revealed that while SEPTA Train No. 4634 was still at the Curtis Park station, the Foreman-in-Charge (Gang C102) had spoken to the Watchman over the radio just prior to the accident to ascertain if the Watchman was feeling any fatigue in his duties. The Foreman stated the Watchman responded that he was doing fine.

Maintenance, inspections, and tests performed by SEPTA personnel on the morning of the accident and during post-accident investigations indicated no exceptions taken in the mechanical operations of SEPTA Train No. 4634. The damage reported as a result of the accident to Car No. 139, the lead car, was relatively minor. A metal panel of the left front steps was severely bent inward with the frame melding severed; it was found later down the embankment along the right-of-way of Track No. 4.

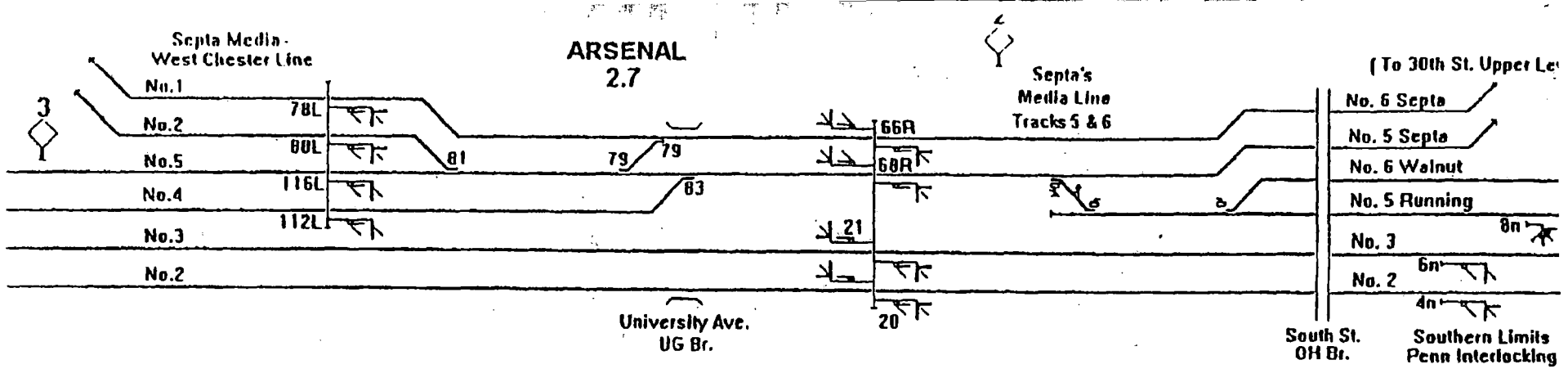
Personnel data regarding the SEPTA Engineer and Conductor revealed both were up-to-date to within the last year for all qualifications, rules tests, and physicals. FRA mandatory post-accident toxicology tests and drug and alcohol tests administered by a SEPTA company were performed on the SEPTA Engineer and Conductor. The results were negative.

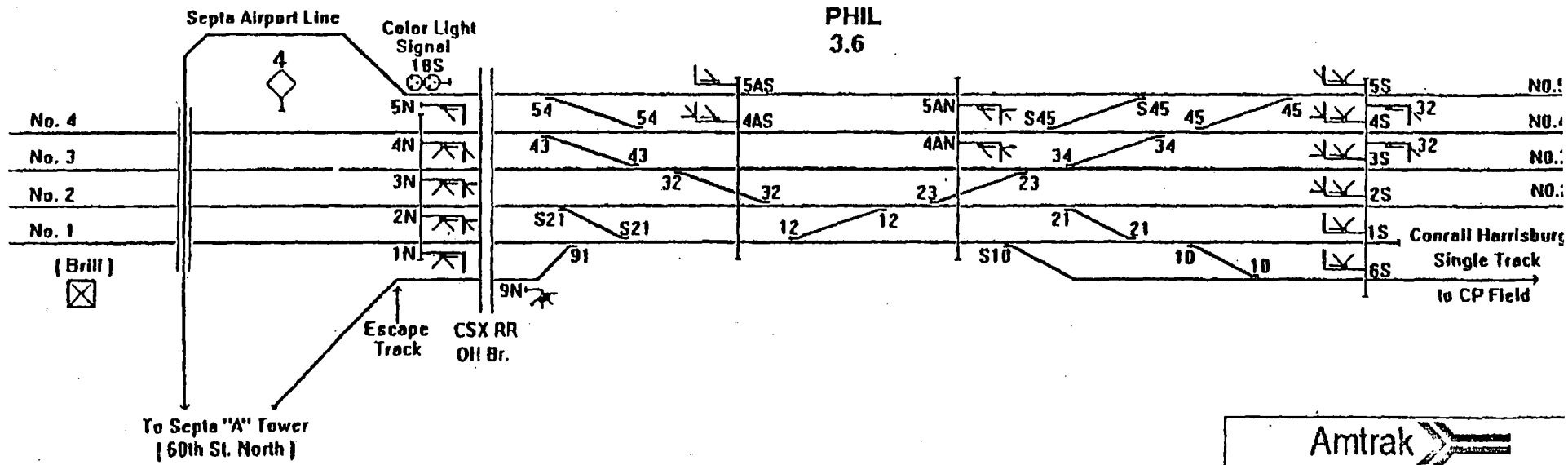
Statements made by both Foremen and the Gang members in post-accident interviews regarding the northernmost Watchman struck by SEPTA Train No. 4634, were very positive. In fact, the Watchman was described as being dependable, hard-working, quiet, and willing to help in any way to complete the job.

A summary of the Watchman's prior 30-day work schedule disclosed that he had reported for work the majority of days, taking only two vacation days. In addition, for one week during that period, he worked as Acting Foreman for the Gang. Also, on many days, he worked a half-hour to an hour in excess of his scheduled working hours. Co-workers stated that the Watchman had volunteered the morning of the accident to work overtime; however, not enough men volunteered, and the overtime was eliminated. Moreover, the Watchman had volunteered to work the position of Advance Watchman for that day's work, as was the routine for those qualified to assign themselves as Watchman on a volunteer rotational basis. Roadway Worker Protection records derived from ATK's Human Resources Development employee transcript reflected that the Watchman was qualified on Roadway Worker Protection Against Trains in April 1996 and January 1997 respectively. In addition, he was qualified on Roadway Worker Protection Equipment in June 1996.

Mandatory FRA post-accident toxicology testing performed at NWT revealed the northernmost Watchman was positive for ethyl alcohol, with a presence of 0.027 percent in his blood sample and 0.061 percent in his urine sample. Further review by Greystone Health Sciences, Inc. concluded that the presence of ethyl alcohol in the Watchman's blood was likely due to pre-death (antemortem) ingestion. Statements by both Foremen and Gang members during our post-accident interviews disclosed that they did not identify any irregularities or signs of impairment that could have impeded the Watchman's performance.

FRA has determined the failure of the northernmost Watchman to remain clear of the right-of-way as the probable cause of death; however, alcohol consumption may have caused him to be inattentive to imminent danger and contributed to his failure to remain clear of the right-of-way.

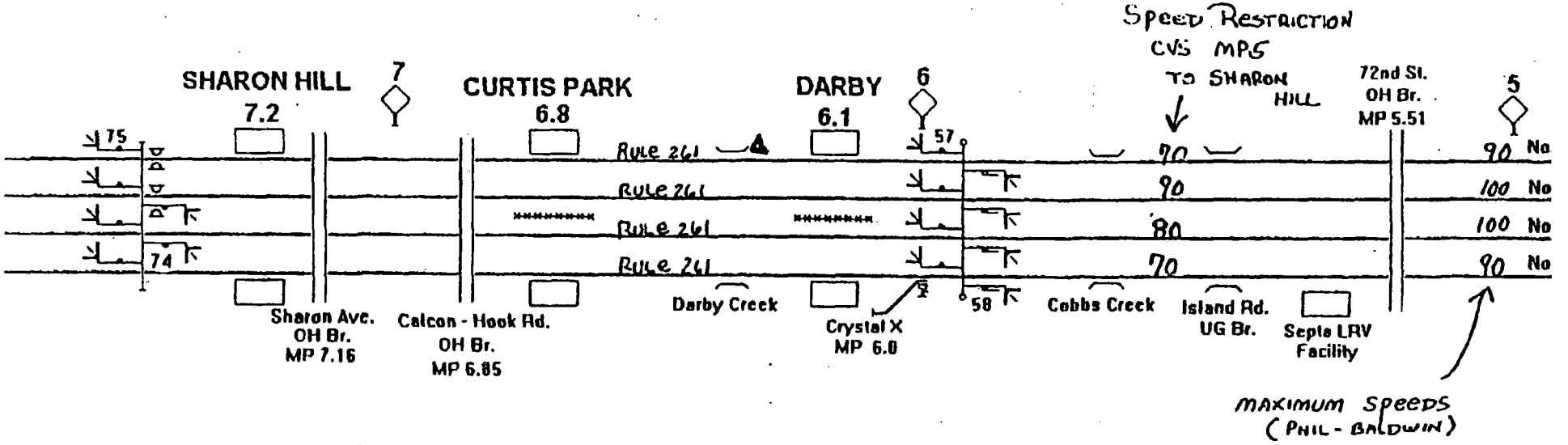


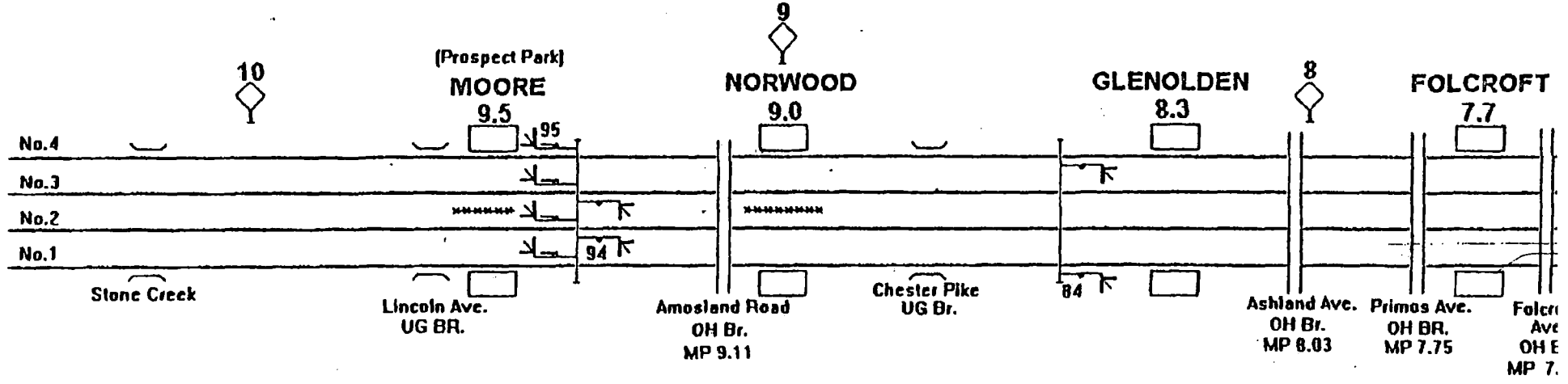


Amtrak

Main Line - Penn to Perry

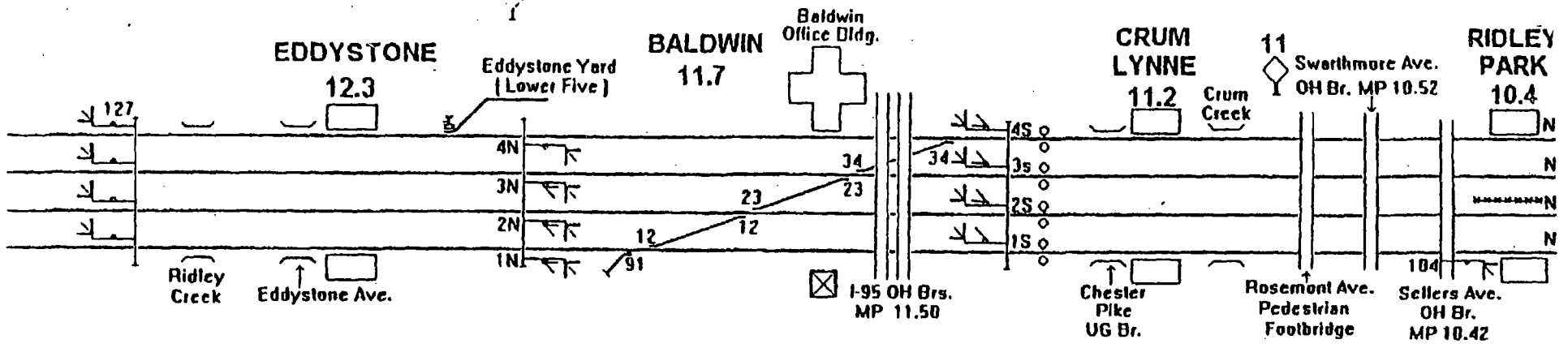
Page 1 Revised 07/01/97

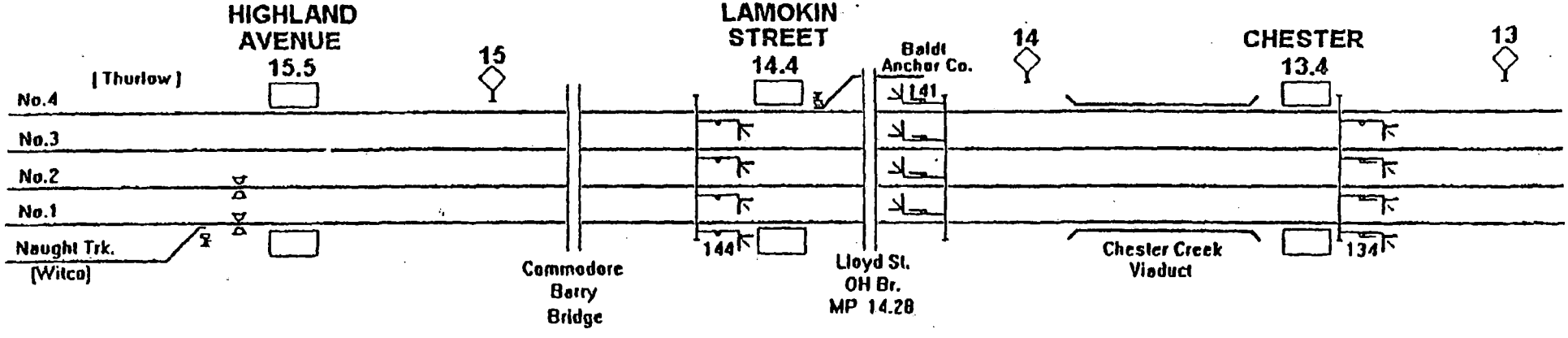




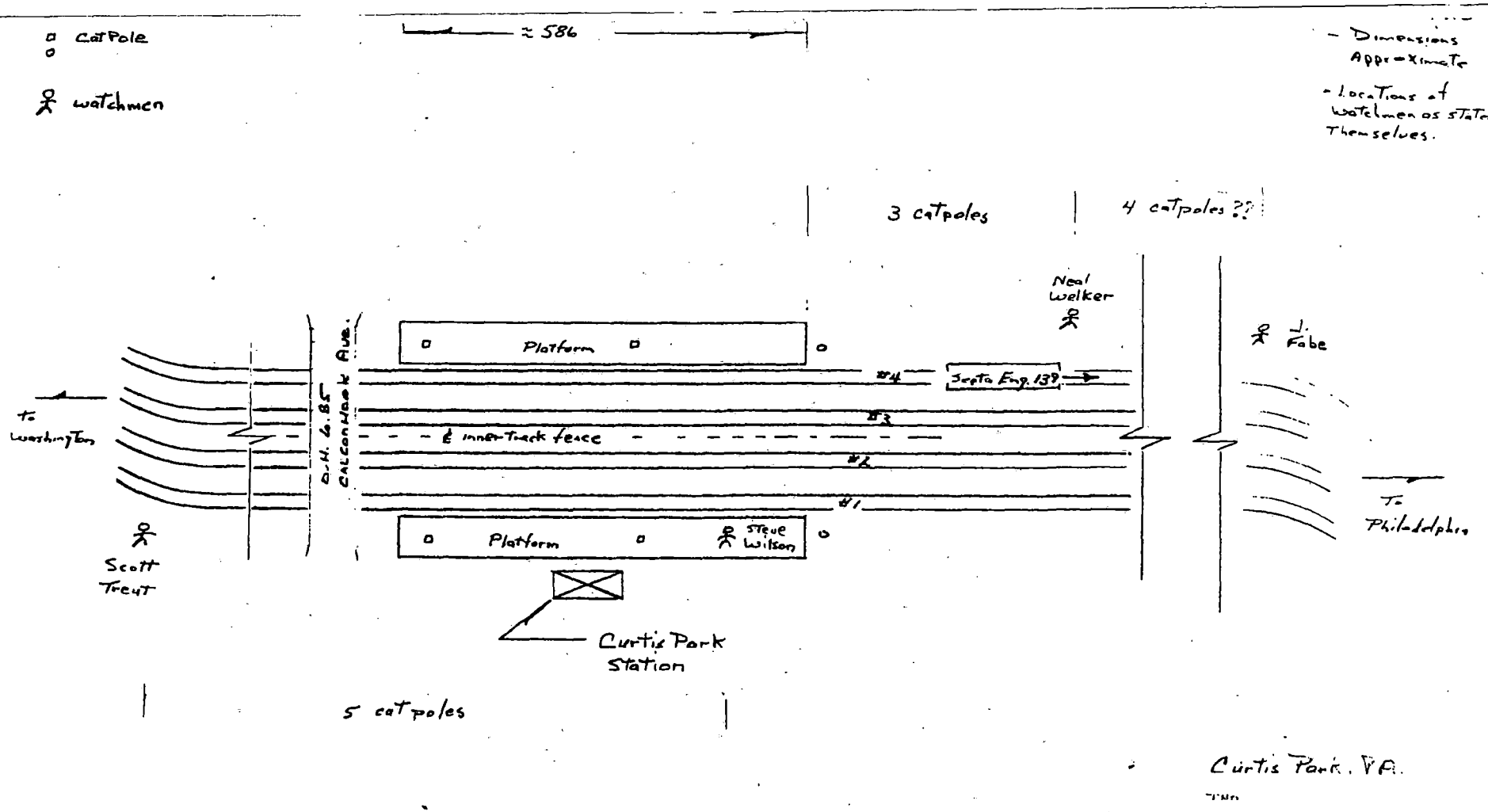
Amtrak

Main Line - Penn to Perry





Amtrak
Main Line - Penn to Perry
Page 3 Revised 07/01/97


catPole
watchmen
≈ 586
- Dimensions Approximate
- Locations of watchmen as stated themselves.
3 catpoles
4 catpoles ??
Neal Welker
J. Fabe
Platform
Platform
#4
#3
#2
#1
Septa Eng. 139
℄ inner-track fence
C.H. & B.S.
CALEDONIA Ave.
to Washington
To Philadelphia
Scott Treat
Steve Wilson
Curtis Park Station
5 catpoles
Curtis Park, VA.

REPORT: FE-35-97

RAILROAD: CSX Transportation, Inc. (CSX)

LOCATION: Fairmont, West Virginia

DATE, TIME: Aug. 17, 1997, 8:59 p.m., EST

PROBABLE CAUSE:

Tractor-Trailer Driver lost control of his truck, crossed the median, and struck the Brakeman's vehicle head on.

EMPLOYEE:	**Craft**	**Transportation**
	Activity	Brakeman was en route to training from his parents' home and was driving a personal vehicle.
	Occupation	Brakeman
	Age	24 years
	Length of Service	One year, seven months
	Last Rules Training	Jan. 10, 1997
	Last Physical Examination	Feb. 13, 1996

Circumstances Prior to the Accident

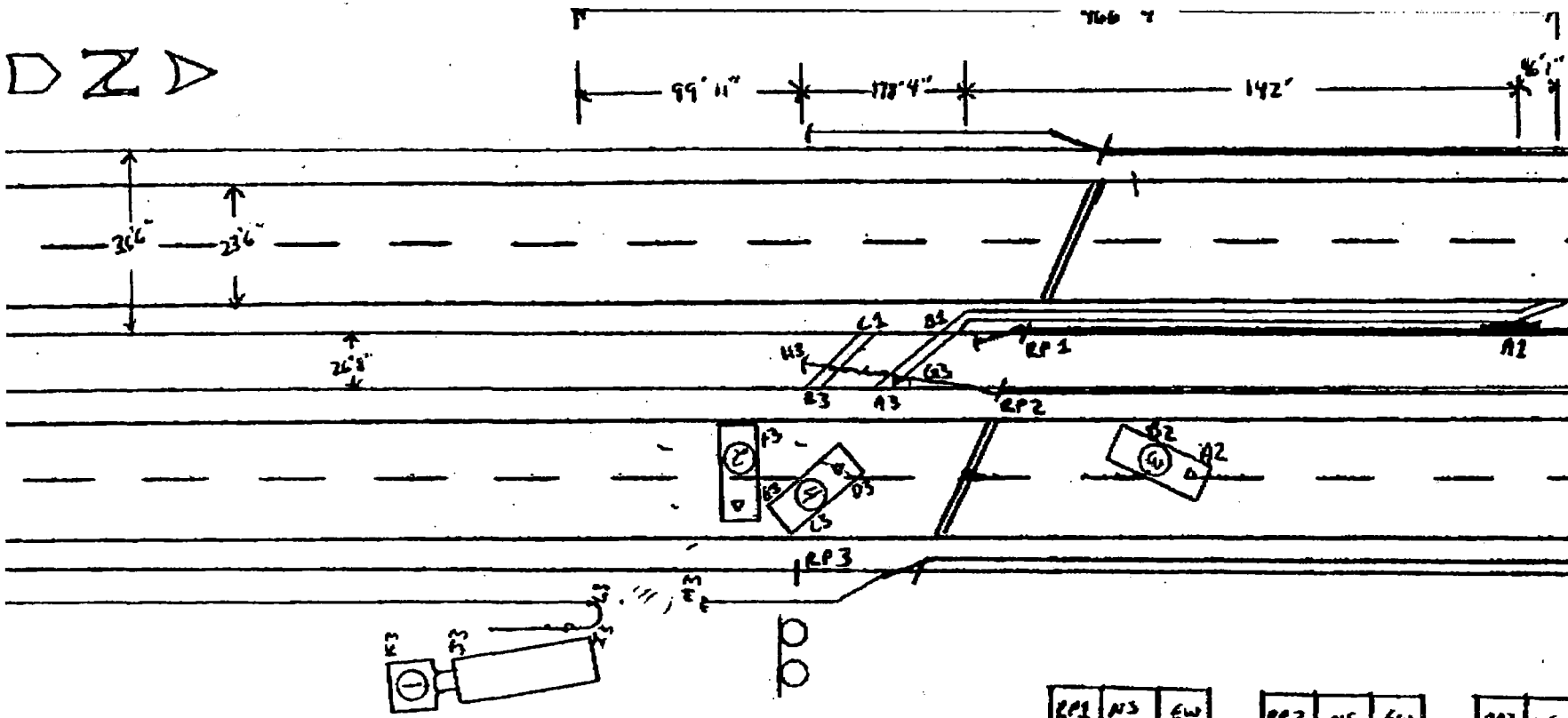
A CSX Brakeman was en route from the home of his parents in Morgantown, West Virginia to attend CSX Engineer Training School in Cumberland, Maryland, when he was involved in a 4-vehicle highway accident. At the time of the accident, it was dark and raining quite heavily.

The Accident

The Brakeman was driving north on Interstate 79 near Fairmont, West Virginia at approximately milepost 130, when the Driver of a tractor-trailer rig lost control on the southbound side, crossed the median, and struck his vehicle head on. The Brakeman was pronounced dead at the scene of the accident. ***(Please see the attached diagram of the accident scene to better visualize the chain of events that led up to the fatality.)***

Post-Accident Investigation

The Brakeman's death was due to injuries sustained in an automobile collision. West Virginia State Troopers from Fairmont investigated the multiple vehicle accident. The Investigators determined that the Tractor-Trailer Driver, traveling at 60 mph, was exceeding the safe speed for poor weather conditions.



RP1	NS	EW
A1	130 3/12	3 5/12
B1	17 1/3	0
C1	51 8/12	0

RP2	NS	EW
A2	53 0/3	2 10/12
B2	61 8/12	0

RP3	NS	EW
A3	36 10/12	0
B3	42 3/3	0
C3	121 0/12	14 3/12
D3	116 7/12	15 3/12
E3	126 0/3	17 11/12
F3	136 0/12	7 5/12
G3	34 7/12	11 0/12
H3	55 5/12	16 10/12
J3	185 4/12	13 7/12
K3	235 6/12	11 3/12
L3	249 6/12	21 3/12
M3	79 6/12	11 4/12
	42 1/12	11 4/12

NOT TO SCALE - DRAWN BY TFC THOMAS WAGNER - 08-17-97

REPORT:	FE-36-97
RAILROAD:	Burlington Northern Santa Fe Railway Company (BNSF)
LOCATION:	Emporia, Kansas
DATE, TIME:	Dec. 2, 1997, 7:45 p.m., CST
PROBABLE CAUSE:	The Conductor was standing foul of Track No. 6802 and did not move in the clear as an oncoming train approached.

EMPLOYEE:

Craft	**Transportation**
Activity	Switching
Occupation	Conductor
Age	50 years
Length of Service	30 years
Last Rules Training	May 18, 1995
Last Safety Training	May 18, 1995
Last Physical Exam	July 21, 1992

Circumstances Prior to the Accident

On Dec. 2, 1997, a Train Crew consisting of an Engineer, Conductor, and Brakeman reported for duty at 10 a.m. (CST) at BNSF Argentine Yard, Kansas City, Kansas. The Crew was assigned to operate Train No. L-KAN-0031-02 from Kansas City to Newton, Kansas on the Emporia Subdivision. All Crew Members had received the required off-duty time prior to going on duty.

The Crew went on duty and received its normal paperwork. After reviewing this paperwork, the Crew Members proceeded to the diesel shop where they boarded the locomotives. Their train was located in the departure yard. After the locomotives were attached to the train, an initial terminal train air brake test was performed, and no defects were noted. The first scheduled work was performed at Lawrence, Kansas. According to the Crew Members, the normal time needed to complete their work at Lawrence was 35 to 40 minutes. Following the switching movement, the Crew performed an initial terminal air brake test on the cars picked up at Lawrence. The next scheduled work for this local was Topeka, Kansas.

At Topeka, the Crew set out four locomotives for repairs at the BNSF Topeka repair facility and picked up one locomotive destined for Newton, Kansas. Next, the Crew completed the scheduled local work and departed for Emporia, Kansas at about 7:15 p.m.

Upon arrival in Emporia, the Crew Members contacted the Footboard Yardmaster for instructions. They were directed to set out the cars on Track No. 6811 destined for Emporia and pick up about seven cars from Track No. 6805. The Crew of L-KAN-0031-02 was told that the paperwork for the seven cars being picked up was in the Emporia Depot.

The Engineer stopped the train (L-KAN-0031-02) at the depot to pick up the paperwork, and the Crew had a job briefing on the way to the west end of Emporia Yard where the switching was to take place. The train traveled through Track No. 6803 on the way to the west end. The job briefing included how the switching was going to be accomplished. The Engineer stated he had been instructed by the Conductor to stop at the west end of the yard. The train was stopped adjacent to the derail on the lead track. Both the Conductor and Brakeman detrained on the left front side of the locomotive and radioed the Engineer to pull ahead. The cars destined for Emporia were located at the rear of the train.

The Conductor walked back to the lead switch on Track No. 6803, and the Brakeman walked east, lining the lead switches for the next move. The Engineer said he couldn't see either Crew Member at this time and the only one giving instruction to him by radio was the Conductor. The Conductor instructed him to stop so he (the Conductor) could take off the EOT (end-of-train device). The Engineer centered the reverser after he stopped for the EOT removal. He observed the head-end device as the brake pipe pressure went to zero and then came back up, at which time the Engineer told the Conductor, by radio, that possibly something was wrong with the air. The Conductor radioed the Engineer that the EOT had been removed. The Engineer stated the next transmission was garbled. The Engineer waited for a minute and radioed the Conductor saying, "Purple," (nickname for the Conductor), "if you are transmitting, I'm not receiving." The next radio contact was the Brakeman telling the Engineer that "Purple" was in the clear and was giving a back-up signal by hand.

The Engineer observed the Brakeman near the clearance point on Track No. 6811. The next move was eastward to set out the cars destined for Emporia on Track No. 6811. After acknowledging the instruction to move eastward, the Engineer repeated the number of car lengths he was given and the compass direction for the move. As he backed toward the set-out track, the Engineer continued to receive and acknowledge the car count for the distance to back up. During this time, the Engineer stated the Conductor had contacted him by radio and had asked the Engineer if he could hear his radio. The Engineer replied, "Loud and clear." The Brakeman continued to give the Engineer car counts until a stop was made. The Engineer looked at the ground and in his small rear-view mirror to judge his deceleration when spotting cars. The Brakeman made the cut in the train and instructed the Engineer, by radio, to pull ahead a specific distance. The Engineer repeated the distance and direction to the Brakeman by radio. This switching move was made with air in the train.

The Conductor verbally instructed him to stop when the rear-through car in the train was over the Track No. 6805 switch. The Crew was aware that a coupling needed to be made on the pick up. The Brakeman remarked, "I'll walk over and get the pick up." The Conductor stopped the Engineer, again by radio, when the rear car of the train was over Switch No. 6805 and said to the Brakeman, "You want me to make this first joint?" The Brakeman said he would make the coupling and then gave the Engineer instructions on how far to back up. After repeating the instructions back to the Brakeman, the Engineer backed up to a coupling and stopped. The time was approximately 7:40 p.m. At about 7:41 p.m., the train was ready to pull west.

The train was stopped for a few seconds when an eastbound train passed the head end of the local. The headlight was on dim, and the local Engineer was waiting for a signal from one of his Crew Members that the air was to be cut in after the consist had been stretched. At this time, the independent brakes on the local were applied in the full position in addition to about 10 pounds of train air brakes, and the reverser lever was centered.

At the time of the accident, the sky was clear with visibility of greater than one mile, and it was raining lightly. The temperature was 38° F.

The Accident

The Engineer of eastbound Z-ALTWSP8-02 initiated an emergency application of the train air brakes as the Conductor on the eastbound train called the Engineer of the local on the radio and remarked, "We hit something when we went by your engines." The Engineer of L-KAN-0031-02 contacted the Brakeman to establish his whereabouts to which the Brakeman replied, "Okay." The Engineer then attempted to contact the Conductor twice and received no response. The Engineer informed the Brakeman by radio that he would head back, and the Brakeman said he would walk west toward the head end of the local.

The Engineer got off the locomotive (L-KAN-0031-02) on the right rear side and noticed what appeared to be a human organ in the locomotive step light. As he walked eastward, he discovered the Conductor's body by the rear of the third locomotive. The Engineer checked the Conductor's carotid artery for a pulse and detected none. The Engineer saw the Brakeman about 8-10 cars to the east on the north side of the local. The Engineer informed the Brakeman that "Purple" was dead and said, "Don't go up there."

The Engineer returned to the lead locomotive of the local and pressed the emergency tone button on the radio. He pressed the button about three times but did not receive a response. He then pressed the non-emergency tone button to contact the Train Dispatcher and received a quick response. The Engineer informed the Train Dispatcher that an ambulance and the police should be summoned to respond at Anderson Crossing (common name).

The Engineer (L-KAN-0031-02) detrained a second time and walked eastward toward the Brakeman when he noticed the train's air brakes had released on the now-stopped eastbound

freight train (Z-ALTWSP8-02) which had started to roll back to the west. He informed the Crew Members of the eastbound train, by radio, that they needed to set the brakes. The Engineer looked west at this time and could not see the rear of the eastbound train.

The Engineer surmised the emergency vehicles would respond from the north, and he told the eastbound Crew Members to pull their train eastward and to watch the foot-counter on the locomotive. When the train had moved a sufficient distance to clear the accident scene, the Engineer instructed the Crew to stop. The Brakeman's pack-set radio was used to accomplish this move.

The Engineer estimated the response time for the first responder's arrival was 15 to 20 minutes. He stayed at the scene until the arrival of a BNSF Special Agent and Claim Agent. This length of time was estimated to be 40 to 45 minutes. After a statement was given to the Sheriff's Department, the Claim Agent gave the Engineer and the Brakeman a ride to the BNSF Emporia Depot where they talked to the Trainmaster. After their interviews, a taxi was waiting to transport both Crews back to Argentine Yard. The Engineer said his arrival time home was 1:40 a.m., December 3.

Responding to the scene were the Lyon County Sheriff's Department, Emporia Police Department, Lyon County Coroner, and a host of BNSF Officers, Special Agents, and Claim Agents.

(Please see the attached diagrams of the Emporia Subdivision and accident scene to better visualize the chain of events that led up to the fatality.)

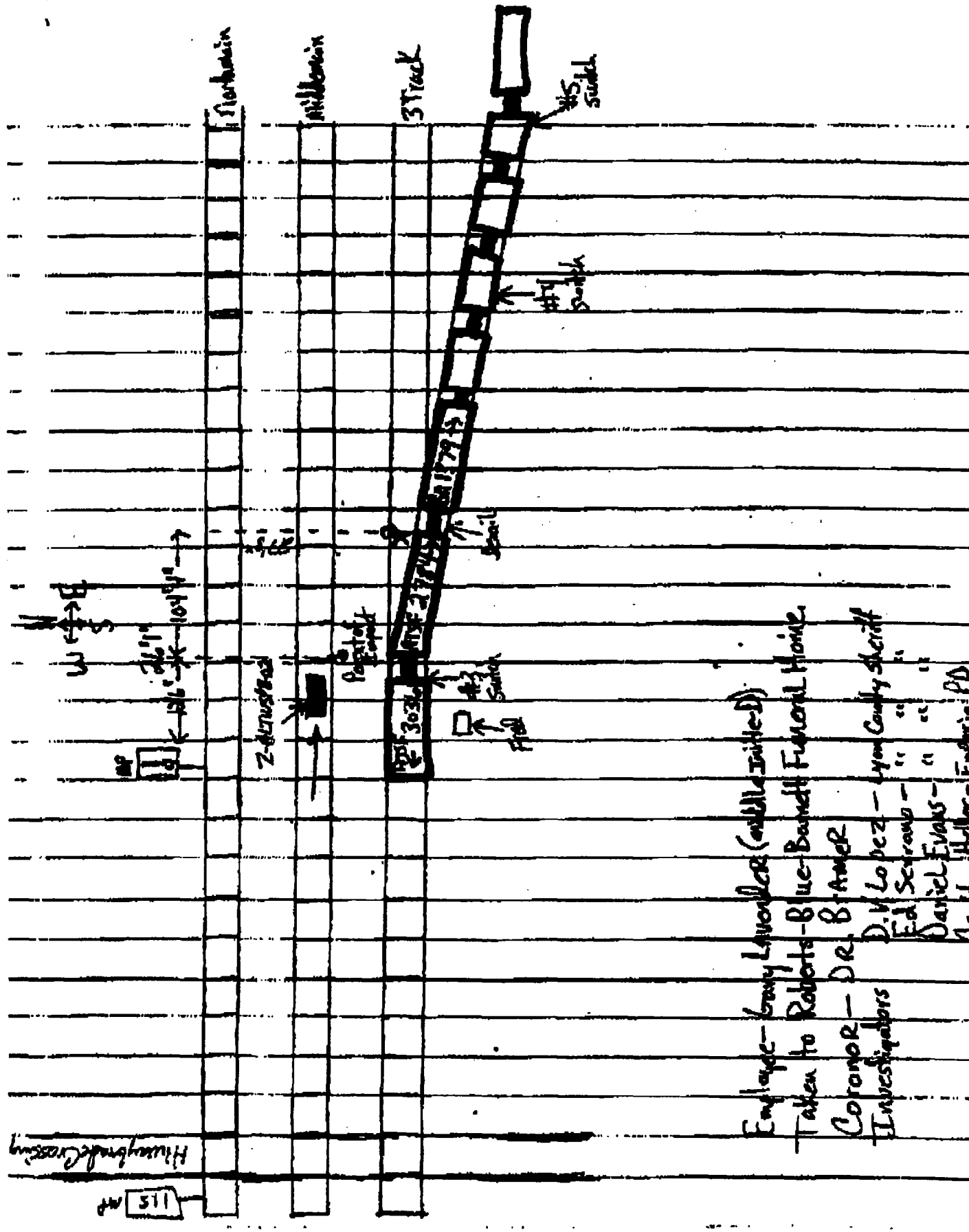
Post-Accident Investigation

The BNSF Manager of Safety and Rules, Kansas Division, accompanied the Coroner to Roberts Blue Barnett Funeral Home to ensure toxicological samples were taken in accordance with Federal regulations.

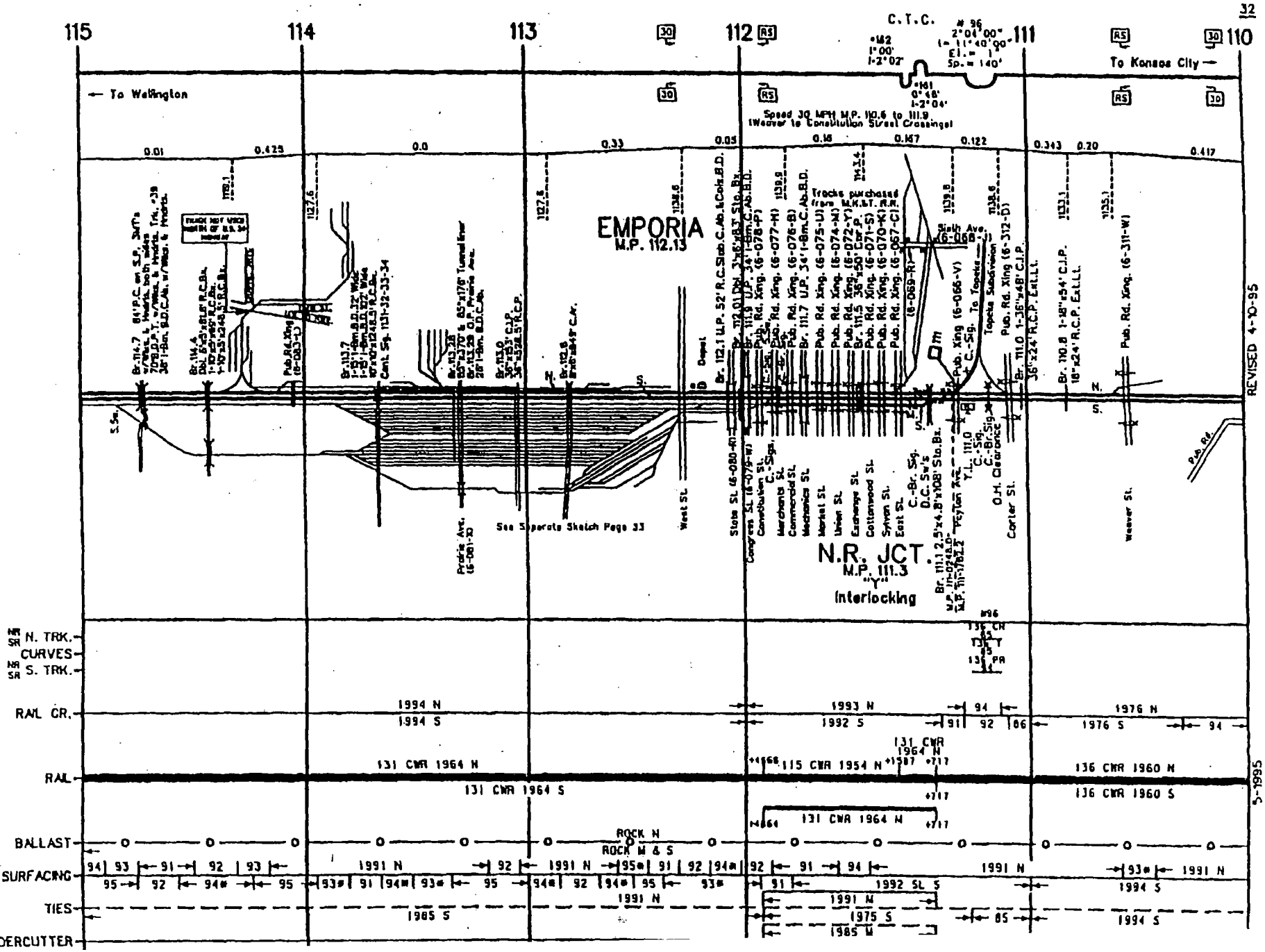
Following Crew interviews and the arrival of relief Crews, a re-enactment was conducted by BNSF to determine sound levels and sight distances. The sound level survey, to determine the sound pressure present when Locomotive ATSF 3036 was in idle position, revealed that dBA levels at various strategic locations were below the 90dBA limit at which hearing protection was required; and locomotive whistle surveys indicated that employees strategically placed near the location of the accident heard the whistle sound.

Investigators determined that the Engineer had been traveling at 55 mph when he saw the Conductor's lantern 1/4 mile from the point of impact, which they considered good sight distance. The Engineer had sounded the horn nine seconds before impact, but applied no emergency brakes until right before he hit the Conductor. Investigators determined that the Conductor, who was wearing no hearing protection, had adequate time to respond.

FRA responded to the scene the following morning, December 3. The agency's investigation revealed the Conductor was standing adjacent to and on the north side of the west end of the steps of the second locomotive in his consist when he was struck by the passing train. The Conductor was standing on the end of the crossties between Track No. 6803 and the Middle Main Track with his back toward the oncoming through-freight train. Investigators could not determine why the Conductor was fouling the adjacent track or why he did not respond to the whistle being sounded by the oncoming freight train.



Enclosure – Gary Lavoie (additional sketch)
Taken to Roberts-Blue-Bartell Funeral Home
Coroner – Dr. Brewer
Investigators D. M. Lopez – Lyon County Sheriff
Ed Serrano – " "
Daniel Evans – " "
[illegible]-Emporia PD



Accident FE-3

REPORT: FE-40-97

RAILROAD: CSX Transportation, Inc. (CSX)

LOCATION: Ashford, Alabama

DATE, TIME: Dec. 9, 1997, 12:12 p.m., CST

PROBABLE CAUSE:

The Electrician was traveling in a company vehicle when another vehicle went through a stop sign and struck the CSX truck in the left rear, causing it to roll over.

EMPLOYEE:

Craft	**MOE**
Activity	Traveling from job site, after completing electrical job, in a company vehicle.
Occupation	Electrician
Age	54 years
Length of Service	27 years
Last Rules Training	Unknown
Last Safety Training	Unknown
Last Physical Exam	Unknown

Circumstances Prior to the Accident

The Electrician had performed electrical work in Troy, Alabama earlier that morning and was en route to Bainbridge, Georgia. He was traveling eastbound in a CSX company vehicle on US Highway 84 east near Ashford. A pick-up truck was traveling southbound on Houston County Road 73.

The sky was clear, and the temperature was 65° F. Road conditions were good: the asphalt was dry, and the view was unobstructed.

The Accident

The Driver of the pick-up truck went through a stop sign and failed to yield the right-of-way to the Electrician. The Electrician ran off the road to avoid a collision with the pick-up truck. The southbound pick-up truck struck the CSX vehicle at the left rear, causing it to turn over several times. The collision resulted in the death of the Electrician at the accident scene.

Death was attributed to multiple blunt force trauma caused by injuries sustained in the vehicle collision. According to the death certificate, the Electrician was pronounced dead at 1:18 p.m.

(Please see the attached diagram of the accident scene to better visualize the events that led up to the fatality.)

Post-Accident Investigation

The Electrician was wearing his combination lap/shoulder seat belt at the time of the collision. His vehicle came to rest upside down, trapping him inside.

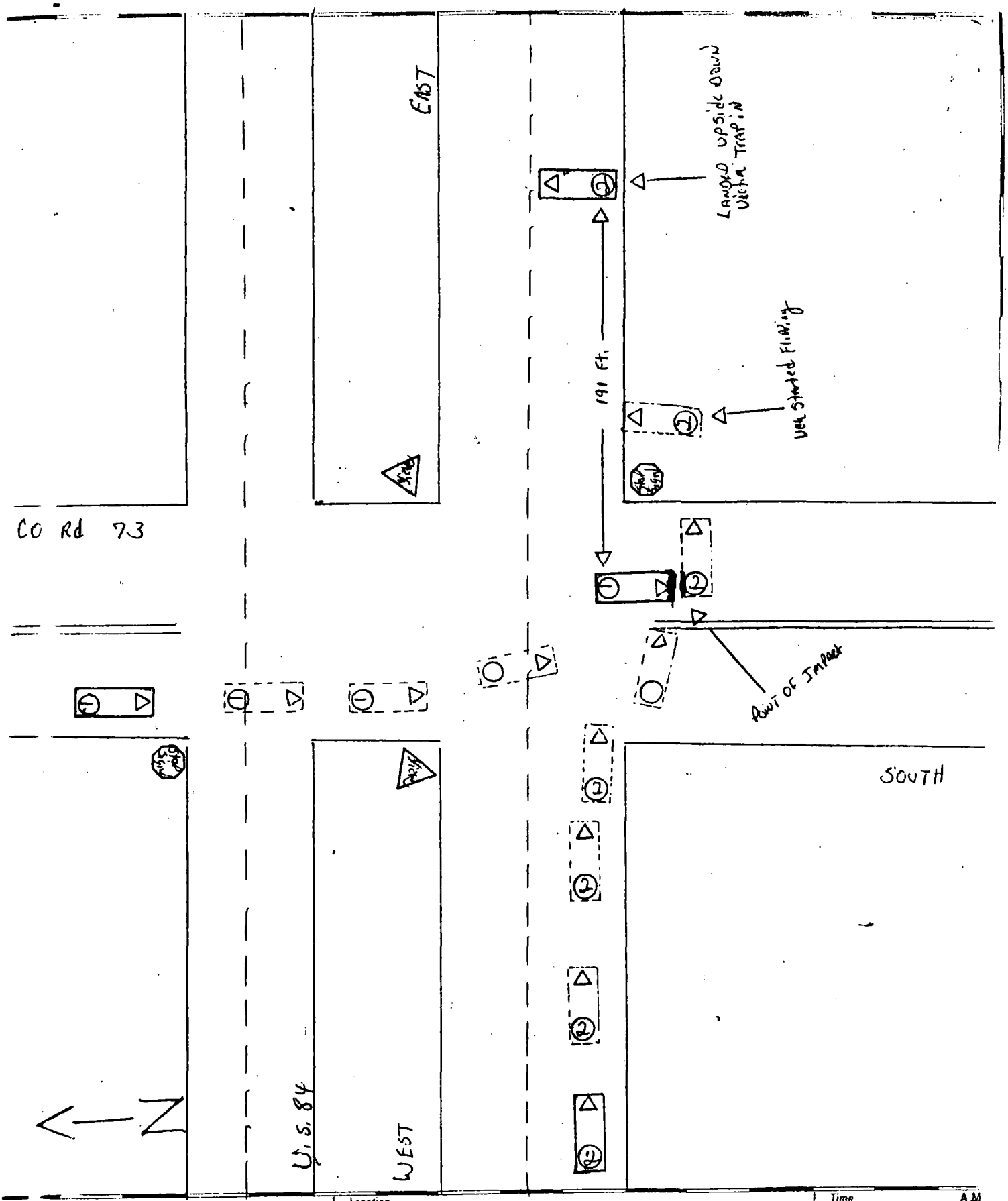


Diagram Not to Scale
Diagram Scale 1 inch = (20 feet) (10 feet)

Location: U.S. 84 & CO. RD 73

Time: 12:12 A.M. (P.M.) MT

Signature of Reporting Officer(s): Larry Flowers

Officer ID: 902

Reporting Police Agency ORI: 0380200

DATE: Month 12 Day 09 Year 1997

REPORT: FE-41-97

RAILROAD: Norfolk Southern (NS)

LOCATION: Ridgeway, South Carolina

DATE, TIME: Dec. 9, 1997, 2:20 p.m., EST

PROBABLE CAUSE:

The southbound Trackman crossed into the path of a southbound pickup truck and was struck while attempting a left turn.

EMPLOYEE:

Craft	**MOW**
Activity	Trackman was en route from a safety meeting to job site in his personal vehicle.
Occupation	Trackman
Age	39 years
Length of Service	13 years

Circumstances Prior to the Accident

On the morning of Dec. 9, 1997, the NS Trackman had attended a Track Department safety meeting in Columbia, South Carolina. He was en route to his regular job assignment with Track Maintenance Gang No. 134 in Chester, South Carolina. The employee was traveling in his personal vehicle, a 1995 Mercury Mystique.

The weather was clear and dry, with temperatures ranging from 50° F to 60° F.

The Accident

The Trackman was traveling southbound on U.S. 21. Three miles south of the city limits of Ridgeway, South Carolina, his vehicle collided with a southbound 1983 Ford F100 pickup truck. Both Drivers were transported to Richard Memorial Hospital in Columbia, South Carolina. The victim was pronounced dead at 6:20 p.m., and the Truck Driver was treated for a broken nose and sprained left wrist and released.

Post-Accident Investigation

The investigation of the accident area revealed that the automobile and the pickup truck were traveling southbound on U.S. 21. The Driver of the southbound pickup truck attempted to pass the automobile in a designated passing zone. When the Driver of the automobile attempted to make a left turn onto a private road, he impeded the path of the pickup truck. The automobile was struck on the Driver's side of the vehicle.

The police report stated that the deceased Trackman was at fault for making an improper left turn, while the Truck Driver was making a legal pass.

FC-41

Norfolk Southern PD Fax:803-733-3978 Dec 22 '97 15:45 P.01

DEPARTMENT of PUBLIC SAFETY
FORM TR-310 (REV. 9/96)

Date	Time	County
12-09-97	1420	20

COLLISION LOCATION: ON 21 FROM Richland County Line TOWARD 4/5

Time Notified	Time Dispatched	Time Arrived	City or Town
1425	1435	1440	Ridgeway

Dir'n Distance 3.00 miles N of 9

Unit #1

1	F	W
Reese - Peggy Ruth		
04-03-63		
RT 2 Box 247S		
Ridgeway SC 29130		
52	D	
1983	PKP	Ford - F-150
SC 1987		EZR-144
635-7050		Reese - Dennis L
RT 2 Box 247S		
Ridgeway SC 29130		
Fairfield		

Vehicle Year: 95 | Make: 55 | Commercial Vehicle: No
Vehicle Color: Maroon | Vehicle Model: | Vehicle Number: | Vehicle Owner:
J-761261

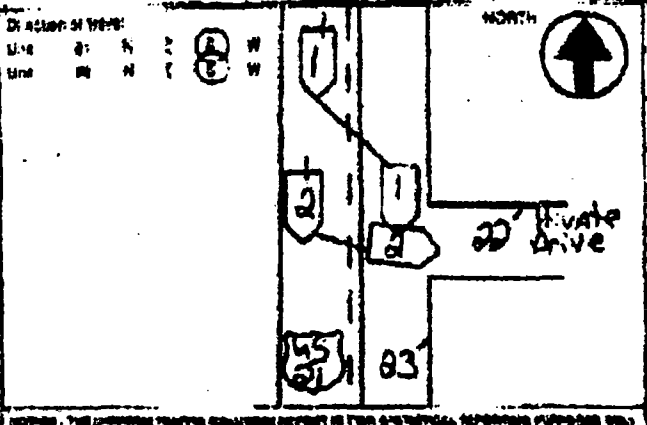
Unit #2

3	M	B
Perry - Larry		
04-05-58		
444 Fairfield St		
Winnsboro SC 29180		
Fairfield		
SC	F	
0030627590		
1995	GM	Mon - Lisa 1G4HR53L4SH635721
SC 1999		FSR-679
635-2473		Perry - Larry
RT 4 Box 152		
Winnsboro SC 29180		

Vehicle Year: 95 | Make: 55 | Commercial Vehicle: No
Vehicle Color: Black | Vehicle Model: | Vehicle Number: | Vehicle Owner:
J-761262

Direction of Travel: Unit #1 E W; Unit #2 N S

NORTH



Unit #1 was traveling South on US 21. The driver of Unit #1 was making a legal pass. The driver of Unit #2 made a improper left turn into the path of Unit #1. Unit #1 struck Unit #2 in the left side.

Unit #1 Farm Bureau Ins. ...

SPECIAL USE ONLY | INTERNAL AGENCY CODE

Damage Amt. $3500.00 | Damage Amt. $2000.00

OCCUPANTS

1	F	W	063-04-03	11	11	1	1	1	3	Driver Unit #1
3	M	B	058-01-05	11	22	1	2	1	4	Driver Unit #2

REPORT: FE-42-97

RAILROAD: Grand Trunk Western Railway Company

LOCATION: Lake Orion, Michigan

DATE, TIME: Dec. 10, 1997, 11:45 a.m., EST

PROBABLE CAUSE:

The Crane Operator did not utilize the crane's outriggers (stabilizers) while attempting to lift and swing excessive weight.

POSSIBLE CONTRIBUTING FACTOR:

A deviation of 2 ½ inches from zero cross level and 4 ¾ inches of vertical movement of the south rail.

EMPLOYEE:

Craft	**MOW**
Activity	Aligning new track with crane
Occupation	Crane Operator
Age	47 years
Length of Service	27 years
Last Rules Training	February 1997
Last Safety Training	February 1997
Last Crane Operating Training	November 1995
Last Physical Exam	June 1997

Circumstances Prior to the Accident

On Dec. 10, 1997, the Crane Operator, upon returning from vacation, reported for duty at 9:30 a.m., EST, at Pontiac, Michigan. The Crane Operator deadheaded Crane LGC 9503 approximately eight miles from Pontiac, arriving at Lake Orion, Michigan at about 11:00 a.m. The Track Foreman, Crane Operator, and three Trackmen had a job briefing about aligning the new track with the crane. After the job briefing, the Crane Operator moved the crane to the end of the new track.

The new track was approximately 120 feet long with one 39-foot track panel lying on top of the extreme end of the track. After the Trackmen set the wood blocking in place, the outriggers were placed on the blocking. Then the cable sling was hooked to the track panel, and the panel was moved from the top of the new track to approximately 20 feet south and set on the ground. Afterwards, the cable sling was unhooked from the panel and attached to the end of the new track. The Crane Operator moved the track in a southward direction approximately three or four inches. The Operator stopped the move and dismounted the crane. The Foreman and Operator agreed the track would be easier to align from the opposite end of the track near the frog.

The Crane Operator then moved the crane eastward to the opposite end of the track and stopped the rear end of the crane near the frog. The Foreman had another job briefing with the Crane Operator and the three Trackmen. It was decided that they would attempt to align the track to the south from that point.

At the time of the accident, the sky was cloudy, and it was snowing. The temperature was 30° F. There were approximately three inches of snow on the ground. The ground in the immediate area was soft and muddy because of the new track construction.

The Accident

The Trackmen hooked the sling to the track structure. The Crane Operator made an attempt to raise the load and swing the boom to the south without the use of the outriggers. The Foreman saw the rail wheels at the rear of the crane lifting up from the rail and notified the Operator. According to the witnesses, the Operator stopped the move, and almost immediately, accelerated the engine and made a short side movement to the north. Then, in a jerking movement, he tried to move the boom to the south. The crane tipped over to the south, pinning the Crane Operator inside the control compartment. The accident occurred at approximately 11:45 a.m.

The Oakland County Sheriffs' Department and Oakland County Response Team arrived at 11:55 a.m. The Orion Township Fire Department arrived at 12:01 p.m. Air bags and wood blocking were used to lift the crane to remove the Operator's body from the control compartment.

Post-Accident Investigation

The investigation revealed that the Crane Operator had been trained Sept. 11 through 14, 1995 to operate the Little Giant Crane. The training was conducted by a Stanley H. Smith Company representative (classroom and field training), who qualified the Operator to operate this crane.

Results of the toxicology test performed on the deceased in conjunction with the autopsy were negative.

The investigation disclosed that Crane 9503 was facing in a westward direction while the Operator attempted to align the track in a southward direction. At the precise location where the left front (south) rail wheel was sitting on the track, the cross level measured 2 ½ inches deviation from zero. The unloaded cross level deviation plus a 4 ¾ inch void under the track ties created a 7 ¼ inch loaded cross level deviation.

Crane 9503 was a 1995 model, 18-ton Little Giant Crane with a 48-foot telescopic boom. The crane, which weighed 68,700 pounds, was delivered to the Grand Trunk Western Railway Company in September 1995 by Stanley H. Smith Company, in Nicklesville, Kentucky.

At the time of the accident, the boom was extended to 43 feet 6 inches. The piston cylinder located between the body of the crane and the boom extended outward 19 inches, putting the boom of the crane at 16 ½ degrees. The Operator's compartment of the crane was located on the front (south) side of the crane.

The Foreman indicated he was aware of the cross level condition of the track and of the void under the ties, and had discussed this matter with the Crane Operator. The Crane Operator was of the opinion that the skeletonized track should move fairly easily.

After the crane was set upright, a thorough inspection was conducted by the Superintendent of Maintenance-of-Way Equipment and his technicians. All mechanical and electrical features of the crane were found to be working as intended.

REPORT: FE-43-97

RAILROAD: Union Pacific Railroad Company (UP)

LOCATION: Topeka, Kansas

DATE, TIME: Dec. 11,1997, 5:05 a.m., CST

PROBABLE CAUSE:

The Locomotive Engineer failed to observe the oncoming train on the adjacent track and was struck after dismounting his locomotive.

EMPLOYEE:

Craft	**Transportation**
Activity	Switching
Occupation	Locomotive Engineer
Age	46 years
Length of Service	23 years
Last Operating Rules	May 31, 1996
Last Physical Exam	May 13, 1997
Last Efficiency Test	Dec. 5, 1997
Last Engineer Re-certification	July 10, 1995

Circumstances Prior to the Accident

At 6:30 p.m. on Dec. 10, 1997, the 2-person Crew, comprising an Engineer and a Conductor, of UP Train No. MSIKCX-10 reported for duty at Salina, Kansas, after receiving the statutory off-duty period. The Crew, after assembling the train, departed Salina at 9 p.m. The train, which comprised two locomotives and 99 cars, traveled to Topeka, Kansas, a distance of 131 miles, without incident. The Crew had instructions to stop at Topeka to set out the trailing Locomotive UP 3587 and the head 49 cars, then depart with 50 cars and the Lead Locomotive UP 3236. The Crew arrived at Topeka at 4:25 a.m. on Dec. 11, 1997, and proceeded to set out as instructed. The locomotive and cars were to be set out on Yard Track No. 2. Upon arriving at Topeka, the Conductor dismounted the Lead Locomotive UP 3236, made the initial cut, and instructed the Engineer to proceed. After placing the 49 cars and the trailing Locomotive UP 3587 onto Yard Track No. 2, the Conductor and the Engineer worked to separate the two locomotives. Next, the Conductor lined the switches. The lead locomotive was returned to the remaining

50 cars of the train on Track No. 1. When the Engineer experienced problems with the main reservoir pressure on Locomotive UP 3236, the Crew contacted the Train Dispatcher and the local Manager of Train Operations (MTO) for assistance.

A second UP train, Symboled CBTAC-09, was a loaded unit coal train comprising two locomotives and 127 cars, which was traveling eastbound toward Kansas City from Marysville, Kansas. The Crew, comprising a Locomotive Engineer and a Conductor, went on duty at Marysville, Kansas at 12:35 a.m. on December 11, 1997, after receiving the statutory off-duty period.

The area was traversed by two main tracks using Centralized Traffic Control (CTC) as the method of operation. The CTC was controlled by the Train Dispatcher located at the Harriman Train Dispatching Center in Omaha, Nebraska. The main tracks were numbered from north to south with Track No. 1 to the north and Track No. 2 to the south. A yard, located to the north of Track No. 1, was accessible by a set of crossover switches from either Track No. 1 or 2. These crossover switches, controlled by the Train Dispatcher, were located approximately 135 feet east of the accident site. An MTO headquartered at Topeka managed this yard.

The maximum authorized speed at the accident location was 40 mph; however, a permanent speed restriction of 30 mph existed just east of the point of impact. Sight distance from the point of impact was approximately 550 feet toward the west.

The accident area was well lit. A large light tower with 14 sodium vapor light fixtures was located one track north of the accident site west of where Locomotive UP 3236 on Train No. MSIKCX-10 was standing on Track No. 1.

Track centers were 13 feet between Track No. 1 and Track No. 2, allowing seven feet, four inches of clearance from the south rail of Track No. 1 to the north rail of Track No. 2. When the track was occupied by locomotives, clearance was approximately four feet, six inches.

At the time of the accident, the sky was clear, and the temperature was below freezing. There were approximately two inches of snow on the ground. In the area of impact, the snow was hard packed from people walking on it.

The Accident

After coupling to the remainder of UP Train MSIKCX-10, the Conductor returned to the cab of Locomotive UP 3236 and awaited the arrival of the MTO. The MTO was in contact with the Crew of MSIKCX-10 via radio. He then proceeded to the train to further assist the Locomotive Engineer in determining the problem with the air brake system. The Conductor and Engineer were at the rear (west end) of Locomotive UP 3236 when the MTO arrived. The Conductor returned to the cab of the locomotive where he was to relay information concerning the air pressure to the MTO and Engineer. The MTO and the Engineer were working on the south side

of the locomotive and adjacent to Track No. 2. The Engineer and the MTO were discussing possible problems when the Engineer decided to dismount the locomotive. He was going to check the angle cocks located on the west end of the locomotive.

The MTO remained on the locomotive and was partially inside the compressor compartment at the west end of the locomotive. The Engineer walked east toward the cab of the locomotive. At this point, the Engineer was struck by eastbound UP Train No. CBTAC-09 at 5:05 a.m. (CST), which was passing by on the adjacent main track.

The Topeka Police Department was the initial emergency responder on the scene. The Engineer suffered blunt trauma injuries. The Topeka Ambulance (a division of the Topeka Fire Department) arrived and transported the Engineer to Stormont Hospital in Topeka, Kansas.

(Please see the attached two diagrams of the accident scene to help you visualize the chain of events that led up to the fatality.)

Post-Accident Investigation

Post-Accident Toxicological Testing was performed consistent with the requirements of Title 49, Code of Federal Regulations, Subpart C. Testing was done only on the Locomotive Engineer of Train MSIKCX-10. Test results were negative.

An inspection of the accident site was conducted on Dec. 11, 1997. Locomotive speed tapes were downloaded from Lead Locomotive UP 6750 on Train CBTAC-09. The tapes indicated a train speed of 32 mph, consistent with interviews from Crew Members, in compliance with applicable speed restrictions for the area. Interviews with the Crew of CBTAC-09 confirmed that the locomotive auxiliary (ditch) lights were not operating. The Engineer stated that he had dimmed the headlight so as not to blind the Crew on the adjacent track. The locomotive whistle was in operable condition, but was not being sounded as the train approached the east end of Train MSIKCX-10.

The Crew Members on Train CBTAC-09 were unaware they had struck the Engineer of Train MSIKCX-10 and continued to operate eastbound. They learned about the accident when they heard the emergency radio broadcast on the company radio.

The Conductor of Train MSIKCX-10 witnessed the event from his position in the cab of Lead Locomotive UP 3236. He was seated at the Engineer's control stand (on the south side of the locomotive which was facing east) and was able to see both the MTO and the Engineer from that position. The Conductor attempted to warn the Locomotive Engineer as Train CBTAC-09 approached from the west, but was unsuccessful. The Conductor recognized (according to testimony) that the Locomotive Engineer was in possible jeopardy, but not imminent danger.

The Locomotive Engineer of Train MSIKCX-10 was struck and thrown between the two main tracks with his head toward Track No. 2. Because the Engineer had been struck in the back, the investigators concluded that he was not aware of the approaching eastbound train. According to the pilot sheet, the Engineer was struck by the front of Lead Locomotive UP 6750 of Train CBTAC-09.

Statements from the MTO and the Conductor of Train MSIKCX-10 varied to some degree regarding the initial contact of the Train Dispatcher to request emergency response units. Topeka Ambulance Crews arrived within 15 minutes. The MTO left the locomotive to render aid and ascertain the condition of the injured Engineer. He called for blankets or coats to keep the Engineer warm. The Engineer was conscious and told the MTO he was having problems breathing. The ambulance arrived shortly and was directed to the location by yard personnel. The Engineer was transported to a local hospital where he died while on the operating table.

An inspection of the train makeup and consist for train CBAC-09 was made. There were no abnormalities noted. A brake test was conducted after the incident, and no defects were noted. In addition, locomotive repair records were inspected, and no exceptions were noted.

Interviews with Crew Members and the MTO were minimal due to the extreme stress these employees endured. The Crew had given statements to UP Claim Department personnel at their request. Interviews conducted by FRA did not vary from those written statements.

UNION PACIFIC RAILROAD

FORM 52072 (Rev. 3-94)

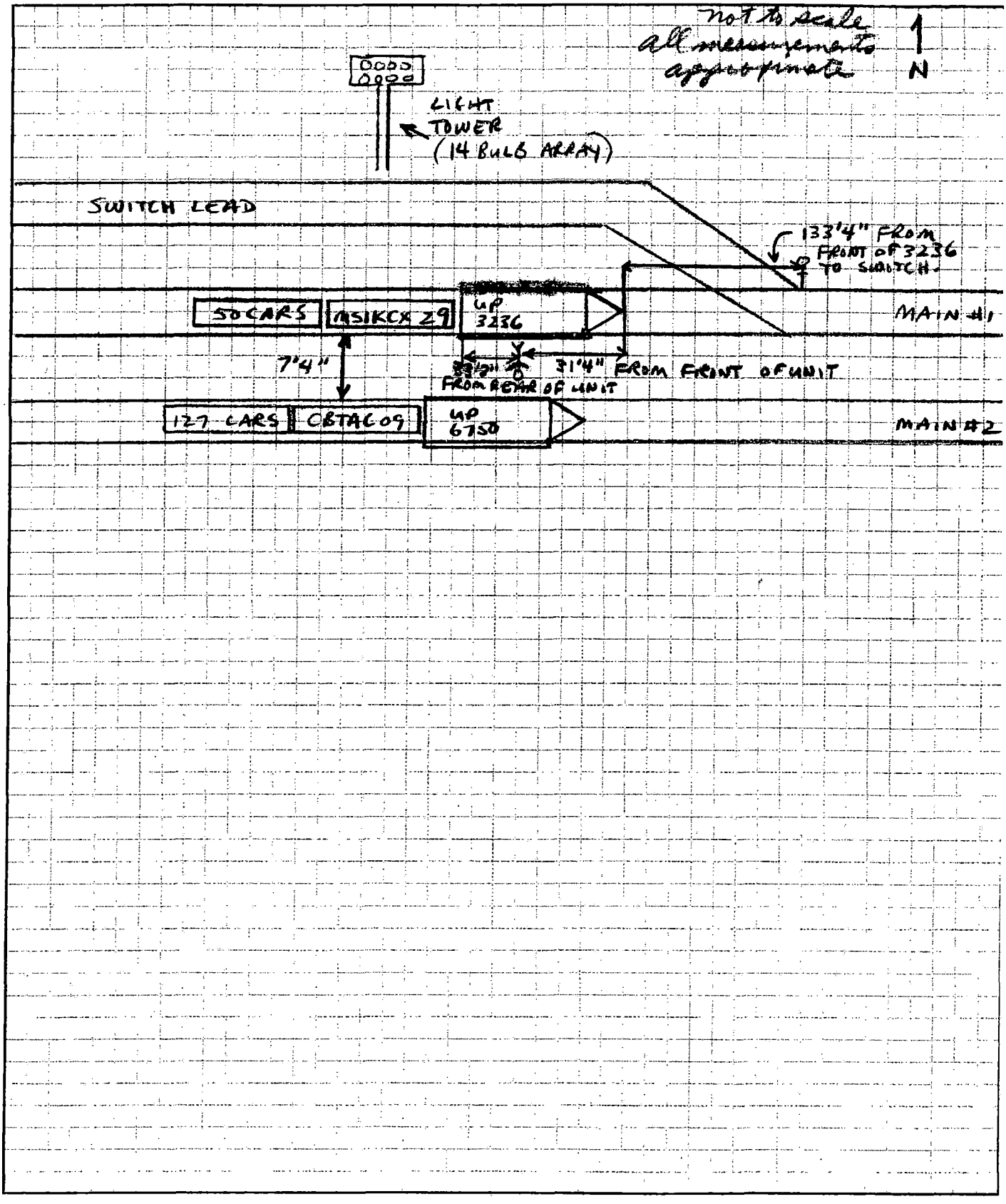
ACCIDENT DIAGRAM

Claimant: JOE L. KING File No. 243620

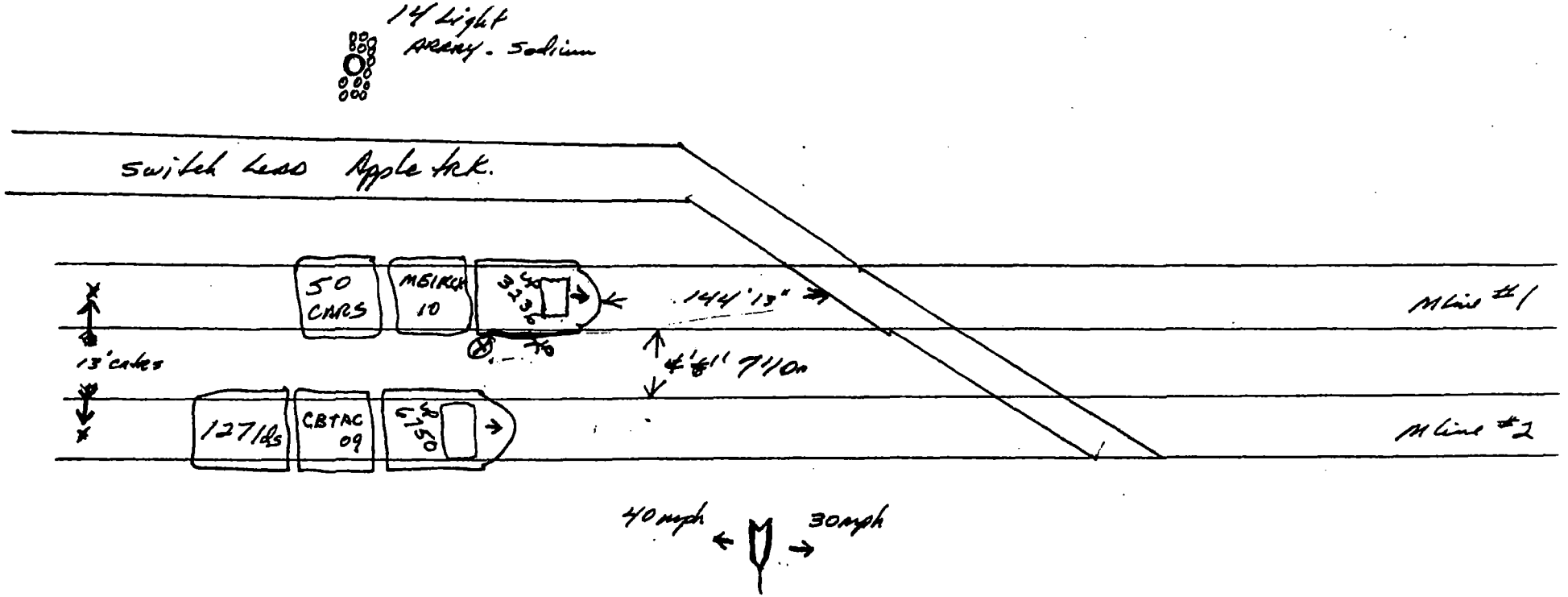
Occupation/Classification ENGINEER Location TOPEKA, K.

☐ PI ☒ PI&D ☐ LDP

Diagram by TW BARNETT Date 12-12-97



1



⊗ Point of impact

Not to scale

MSIRCK · 10 · Stopped E·BND

CBTAC · 09 31 mph E·BND

N. A. Angell III

12-1-97

REPORT: FE-45-97

RAILROAD: Union Pacific Railroad Company (UP)

LOCATION: Boise, Idaho

DATE, TIME: Dec. 26, 1997, 5:45 p.m., MST

PROBABLE CAUSE:

Crew Members did not clearly convey their intentions during radio transmissions for the movement of the train.

EMPLOYEE:	**Craft**	**Transportation**
	Activity	Switching
	Occupation	Conductor
	Age	55 years
	Length of Service	32 years
	Last Rules Examination	May 2, 1997
	Last Safety Training	May 2, 1997
	Last Physical Examination	Feb. 22, 1991

Circumstances Prior to the Accident

Following completion of a required off-duty period, the Conductor went on duty at 8:15 a.m. MT, on Dec. 26, 1997, at UP's Nampa, Idaho, Yard Office. The Conductor was part of a 3-person Crew comprising an Engineer, Conductor, and Brakeman. The Crew was called to work Assignment LIK 48-26. Crews given this assignment normally operated up to 12 hours and performed routine road switching operations on the Boise Subdivision. The Boise Subdivision was a single main track operated by Track Warrant Control (TWC). Prior to departing Nampa, the Conductor was observed by the Crew to be fit for duty.

The Crew performed various switching operations during the shift with no unusual occurrences. At approximately 5:30 p.m., the Crew began switching at the Croman Lumber Company. The train comprised two locomotives located on the west end and 26 freight cars to the east. The Engineer was positioned at the controls of the second locomotive UP 2358 which was facing east. The Brakeman was located approximately 400 feet east at a highway-rail grade crossing, which was blocked by the freight cars. The Conductor was positioned on the north side of the

train at the switch clearance point to the Croman Lumber track. All communications were made via radio transmission. The Conductor instructed movement of the train west. When eight cars destined for the lumber company reached the clearance point, the Conductor instructed the Engineer to stop. The intent was to uncouple the cars from the train and place them in the lumber company for loading. The Engineer stopped the train by making a train air brake application. At this time, the Brakeman requested that the train be moved an additional two car lengths west to clear the crossing and allow vehicular traffic to pass.

The Conductor's response was affirmative. According to the Brakeman, the Conductor said "We can do that," which the Brakeman thought meant immediately. Per his instructions, the Engineer released the brakes and moved the train an additional two car lengths west.

At the time of the accident, it was dusk, the sky was clear, and the temperature was about 27° F.

The Accident

When the crossing was clear, the Brakeman told the Engineer to shove the train east so the Conductor could resume switching operations. The Engineer moved the train east, and after moving approximately four or five car lengths, brought the train to a stop. He attempted to contact the Conductor three or four times, but received no response. The Brakeman informed the Engineer he would walk toward the Conductor to determine the problem.

The Brakeman began walking the train and observed the Conductor lying between the rails under an empty wood chip car approximately two car lengths east of the switch. He notified the Engineer that the Conductor was hurt and asked the Engineer to call an ambulance. The Engineer turned his radio to a road channel and pressed the emergency button. The Dispatcher responded immediately. The Engineer then informed the Dispatcher of the accident and requested an ambulance and the police department.

The Ada County Sheriff's Department received notification at 6:03 p.m. The Fire Department's Paramedics arrived at the scene between 6:05 and 6:10 p.m., removed the Conductor from under the car, and began resuscitation efforts.

The Ada County Coroner arrived at 6:30 p.m. and pronounced the Conductor dead at the accident site.

(Please see the attached diagram of the Boise Subdivision to better visualize the accident scene and the chain of events that led up to the fatality.)

Post-Accident Investigation

The Ada County Coroner performed an autopsy on the deceased Conductor. The Autopsy Report and the Certificate of Death stated the cause of death as "Multiple Traumatic Injuries."

Mandatory Post-Accident Toxicological Testing of the deceased and other Crew Members was performed under the authority of 49 CFR Part 219, Subpart C. All test results were negative.

The railroad reported no damage to equipment as a result of the accident. The cars in the train consist were inspected by the UP Mechanical Department personnel, who found them free of defects and the safety appliances functioning as intended. Inspection of the freight car UP 147572 determined that the angle cock of the train line air brake system was turned, closing off the train air line. Further inspection revealed blood and body tissue on the outside of the L-3 wheel of the lead truck on the "A" end or east end of the car.

The footing in the accident area was a slightly raised, ballasted track bed. The tracks were clean of any material that would create a tripping hazard. There was no snow, and the ground was dry. The footwear which the Conductor was wearing at the time of the accident was examined, and nothing was found that could have caused or contributed to the cause of the accident.

A printout of the locomotive event recorder revealed that switching movements had been made at a speed of one to five mph.

Interviews with the Engineer and Brakeman indicated that radio procedures had not been followed when no specific distance was given by the Brakeman before a shoving move was executed, and the Engineer executed the move without receiving a specific distance.

Following the investigation, UP's Portland Service Unit issued Accident Prevention Alert No. 26, which reviewed possible causes of the fatality, applicable safety rules when closing an angle cock, and precautionary procedures for working around moving equipment. The railroad also conducted safety meetings with all employees to discuss the accident.

IDAHO DIVISION
BOISE CUT-OFF

58

CONSTRUCTED 1887-1888 IDAHO CENTRAL RY. CO. BALLASTED & RELAID FOR MAIN TRACK 1924-1925

CONSTRUCTED 1923-1924 BY THE OREGON SHORT LINE RR CO.

L.C. 1942

MOBILE-TEL. STA.
NAME
RANGE
M.P. M.P.
M.P. LOCATION
YARD LIMIT
DRAG. EQPT. DET.
HOT BOX DET.
PWR. SW.
SPG. SW.
INT. SIG. & NO.
ABSOLUTE SIG.
HIGH, WIDE
SHIFTED LOAD DET.
TEMP-WIND GAGE
HIGH WATER DET.

TOPOGRAPHY

ELEV. TOP OF RAIL AT STATION M.P.
CONTROL POINTS & STATION NAMES
CIRCULAR T NUMBER
MILE POST LOCATION
LGTH (CLEAR) OF SIDING

MAX. GRADE PERCENT (SUB GRADE)

SLIDE WARNING
EL. ABOVE SEA LEVEL
FIBER OPTICS
C. T. C.
A. B. S.
SPEED ALLOWANCE
AUTH. SUPER ELEV.
TOTAL ANGLE
ALIGNMENT & FLANGE LUBRICATORS
DEGREE OF CURVE
RAIL
SURFACING & LINING
TIE GANG

B460 B455 B450 B445 B440

B-459.86 9' CMP
B-456.93 5' RCP
B-456.88 5' CMP
B-452.75 2-SP. SPTBD
B-451.81 TWIN OH VIAD.
B-450.93 3-SP. SPTBD
B-450.91 PS BEGIN BOISE BR.
B-450.17 5' CMP
B-450.11 6' X3'
B-445.30 6'X 4' CMPA
B-445.19 4'X 8' TWB
B-448.93 3-SP. TPTOD
B-448.50 105' SBGBD
B-448.22 70' DPGOD
B-446.31 15' SSP
B-446.08 OH VIAD.
B-446.07 103' TPGOD
B-443.34 OH VIAD.
B-443.13 OH VIAD.
B-442.37 10' SPP

TEN MILE CREEK
FIVE MILE CR.
RIDENBAUGH CANAL
BOISE BR
DEPOT
VISTA AVE
RIDENBAUGH CANAL
UNDERGRADE XING N.Y. CANAL
BOISE AIRPORT RD.

EL. 2609 MERIDIAN 18305 B457.50 3850
EL. 2646 BEATTY 18302 B454.90
EL. 2705 PERKINS 18299 B451.40
EL. 2712 BOISE JCT. 18298 B450.90
EL. 2753 BOISE 18296 B448.60 S1055
EL. 2855 HILLCREST 18292 B445.20

-0.63 -0.43 -0.62 -0.38 -0.27 -0.18 -0.39 -0.61 -0.36 +0.17 -0.18 -0.36 -0.24 -0.29 -0.35 -0.48 -0.39 -0.21 -0.41 -0.47 -0.44 -0.39 -0.24 -0.14 -0.29 -0.76 -0.44 -0.26 -0.42 -0.27 -0.31 -0.37 -0.29 -0.40 -0.10 -0.31 0.00 -0.23 -0.50 -0.71 -0.92 -1.00 -0.56 -1.00 -0.53 -0.94 -1.00 -0.73

2562 2569 2574 2580 2583 2593 2596 2600 2606 2611 2610 2611 2615 2618 2636 2639 2642 2659 2663 2669 2683 2690 2695 2702 2705 2710 2721 2724 2728 2730 2732 2738 2741 2743 2750 2752 2763 2763 2767 2780 2786 2800 2852 2863 3007 3019 3076 3087

59-40 20-20 55-40 59-40 30-25

3/4" 1" 1" 1-1/2" 1-1/2" 3-1/2" 3-1/2" 3-1/2" 3-1/2" 3-1/2" 3-1/2" 4-1/2"

4°00' 13°55' 9°00.7' 29°58.7' 39°05' 50°45.3' 51°42.4' 77°01.8' 80°52.7' 17°59.7' 06°47.2' 58°39'

0°30' 1°34.2' 1°36.7' 3°02' 3°30' 3°00.8' 3°00.8' 3°00.3' 3°00.1' 3°05' 1°30.1' 3°47'

133
1950
1980
1980
1967
1967

GRC

RAIL, SURFACING & LINING AND TIE GANG CORRECTED FOR MAY 22, 1987

ALIGNMENT & PROFILE CORRECTED FOR AUGUST 1, 1991

8015

APPENDICES

APPENDICES
(A-SERIES)

APPENDIX A

ANALYSIS OF 1997 EMPLOYEE FATALITIES

Considering data such as railroad, craft, position, and activity, in addition to Possible Contributing Factors (PCF), defined as underlying or root causes or part of a chain of events leading up to the fatality.

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-01-97	Soo Line Railroad (SOO) Milwaukee, WI Region 4	January 01/08/97 11:25 am, CST	**Gang A Assistant Foreman** 52 years old 32 years of service Last rules trng: 3/28/96 Last safety trng: 3/28/96 Last physical: 10/20/95	**Craft: MOW** **Positions:** **Gang A:** Foreman Asst. Foreman Laborer **Gang B:** Foreman 3 Trackmen **Activity:** Repair of track damaged by derailment	Vapors from an oxygen/acetylene gas tank set in an enclosed area were ignited by flying sparks from a rail saw. This caused an explosion within the compartment, resulting in debris striking the nearby employee. The acetylene tank was turned off; however, the oxygen tank shut-off valve was a half-turn open. In addition, a 2-inch drain hole in the bottom of the gas compartment was not plugged up. The spark from the saw could have caused the mixture of oxygen and acetylene vapors, exiting through the drain hole, to explode.	The Laborer asked the Foreman to check the valves. He should have checked them more closely, and the Laborer should have double-checked as well.	**Training Insufficient:** Gas compartment lacked a poster on oxygen and acetylene safety. OSHA cited non-compliance with 29 CFR Part 1910.252 (a) (2) (xiii) (C): The employer did not recognize its responsibility for the safe usage of cutting or welding equipment. Specifically, the employer did not assure that Supervisors and Railroad Crew employees were properly trained in the safe operation and/or usage of oxygen/acetylene equipment for cutting in areas where a potential source of ignition was present.	

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-02-97	Union Pacific Railroad (UP) South Fontana, CA Region 7	January 01/12/97 10:15 pm, PST	**Conductor:** 60 years old 35 years of service Last rules exam : 10/19/95 **Last physical : 09/05/78** Last drug test: 08/03/93	**Craft: Transportation** **Positions:** Engineer Conductor Brakeman **Activity:** Switching	The Engineer controlled the speed of the train by using the independent brake while making a shoving move. Slack occurred, causing the draw bars and couplers to change rapidly from buff to draft. A violent, surging movement ensued, causing the Conductor to be jolted and lose his grip. He then fell in front of the lead car and was struck.	Appropriate safety precautions were not taken for a large number of cars. A consist of 50 loaded cars should have received air, especially with a person riding on the back of the car.	**Inexperience of Engineer and Brakeman:** During his career, the Engineer had never switched while making a shoving movement. The Brakeman had never worked on a shoving move with a large number of loaded cars.	

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-03-97	Norfolk Southern Railroad (NS) Macon, GA Region 3	January 01/19/97 6:40 am, EST	**Car Inspector:** 42 years old 16 years service Last rules trng: 01/18/97 Last safety trng: 01/18/97 **Last physical: 07/20/79**	**Craft: MOE** **Positions:** **Yard Staff:** Car Inspector Mechanical Department Supervisor Tower Yardmasters **Train G-25:** Engineer Conductor **Train M-98:** Engineer Conductor **Train G-09:** Crew members not specified. They discovered the body. **Activity:** Establishing Blue Flag protection and switching.	The Carman fouled track adjacent to two tracks involved in the assignment, and he was struck by moving equipment.	The Carman wore dark clothing and left his hand-held light in the truck.	Train M-98's Engineer neither sounded the bell nor illuminated the locomotive headlight as required by the railroad's Operating Rule No. 17. He was a repeat offender, having been cited during a December 1996 safety audit for not having the locomotive headlight illuminated.	

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-03-97 CONT.					**PCF NO. 4** Vision and hearing were impaired for Train M-98's Engineer and Carman. The pole-mounted light at the site was diminished to almost total darkness when the two locomotive consists passed the switch to Tracks 2 and 3 at the same time. The sound from the locomotives of Train G-25 in close proximity to the Carman may have masked the sound of the approaching locomotives of Train M-98.	**PCF NO. 5** The Yardmasters in the towers, who had regularly attempted to notify all affected parties of yard movements when possible, did not provide such a notification in this instance.	**PCF NO. 6** The Car Inspector's regular shift was 7 am - 3 pm. He reported for duty at 11 pm and worked the shift in overtime status. Fatigue may have decreased his alertness on the tracks.	

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-03-97 CONT.					PCF NO. 7 Just prior to the incident, the Conductor of Train M-98 was controlling the northward movement of the locomotives from one of the locomotive cabs. His view of the track in the direction of movement was obstructed by the long hood end of the locomotive he was riding.			

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-04-97	UP Mason City, Iowa Region 6	January 01/29/97 12:55 am, CST	**Conductor:** 48 years old 28 years of service Last rules trng: 03/08/96 Last safety trng: 01/24/96 **Last physical: 04/09/87**	**Craft: Transportation** **Positions:** Conductor Engineer **Activity:** Switching	The Conductor and Engineer failed to communicate properly, via company radio, directions regarding a backing movement. Per proper radio procedures, the person transmitting instructions should expect the recipient to repeat them. Failure to do so should indicate a potential problem. The Engineer did not wait for this confirmation.	The Conductor did not exercise vigilance while walking on the tracks. His footprints on the track were facing in the opposite direction, which indicated that he did not stop or turn around to look toward the approaching locomotive.	Habitual use of ear plugs probably prevented the Conductor from hearing radio instructions.	
FE-04-97 CONT.					**PCF NO. 4** The Engineer did not use proper warning devices to give a back-up signal.			

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-05-97	Consolidated Rail Corporation (CR) Burns Harbor, IN Region 4	February 02/02/97 9:55 pm, EST	**Yard Conductor:** 54 years old 27 years of service Last rules test: 01/29/96 Last safety trng: 01/29/96 Last physical: 01/31/92	**Craft: Transportation** **Positions:** **Train WDBH (Job 63):** Yard Conductor Yard Brakeman Locomotive Engineer **Train WDBH (Job 61):** Conductor Brakeman Engineer **Activity:** Switching (Per report, all assigned to same train.)	The Yard Conductor, who was not vigilant while walking on tracks, was struck by freight cars during a shoving movement.	While shoving cars, the Engineer did not control train movement to permit stopping within one half the range of vision short of obstructions, per the railroad's operating rules.		

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-07-97	Burlington Northern Santa Fe Railroad Company (BNSF) Beatrice, NE Region 6	February 02/12/97 10:35 pm, CST	**Relief Conductor:** 56 years old 27 years of service Last rules trng.: 01/21-22/97 Last safety trng.: 01/21-22/97 Last physical: 02/25/94 **Student Brakeman:** Injured with compound fractures in both legs. **Crew Van Driver:** Injured with cervical sprain.	**Craft:** **Transportation** **Positions:** **Train 25645-12** Engineer Conductor Brakeman Student Brakeman **Yard Staff:** Humpmaster Yardmaster **Train 110:** Not specified (This train blocked and delayed the above train.) **Train 25645-12 Relief Crew:** Engineer Conductor Brakeman **Crew Van Driver** **Driver of the pickup truck** **Activity:** Crew change	The Relief Conductor, standing to the rear of the Crew van during a Crew change, was struck by a pickup truck. The driver of the pickup truck was charged with driving under the influence of alcohol.	The back doors of the van were open, obscuring the van's flashing lights from the rear. Therefore, the Truck Driver may not have seen the van ahead of him.		

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-09-97	SOO St. Paul, MN Region 4	February 02/03/97 11:25 am, CST	**Track Laborer:** 37 years old 6 years of service Last rules trng.: 6/14/94 Last safety trng.: 6/24/96 Last physical: 05/04/93	**Craft: MOW** **Positions:** **Track Gang:** Track Laborer Asst. Foreman Truck Driver (also Lookout) Trackman **Switch Crew 4705:** Engineer Conductor Brakeman **Activity:** Cleaning and salting switches.	Track gang employees did not comply with the provisions of the carrier's on-track safety rules and procedures manual. **Without notifying the Lookout or other Trackmen,** the Track Laborer left switch 26 (where they all were) and walked between temporary yard office buildings to the 32 crossover turnout where he began setting the switch.			

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-10-97	CR Newark, NJ Region 1	March 03/21/97 7:15 pm, EST	**Car Inspector:** 55 years old 2 yrs. 9 mos. of service Last rules trng.: 3/20/97 Last safety trng: 3/21/97 Last physical exam: 3/11/97	**Craft: MOE** **Positions:** **Yard Crew:** 2 Car Inspectors Yardmaster Foreman **Switch Crew for Job YPOI-31:** Engineer Conductor Brakeman **Activities:** Inspection of 72 cars for outbound train and switching at the same time.	Carman failed to maintain proper vigilance for moving railroad equipment while fouling unprotected track.	**Little experience and rustiness with job:** The fatally injured Car Inspector had *fewer than three years* service with this railroad, of which *one year eight months was spent as an extended absence to recover from a shoulder injury sustained on the job.* **He had returned to work the day before.** The Car Inspector was previously employed as a ***Brakeman*** by the New Jersey Transit Rail Operations (passenger trains only) from 1/10/94 to 9/16/94. Along with the other employees, he received a *routine* job briefing conducted by the Carman's Supervisor (Foreman).	Due to the right-hand curvature of Tracks Nos. 7 and 8, the Engineer for Job YPOI-31 could not see the end of the leading car from the locomotive cab. Four cars and the locomotive were en route to couple to a tank car when the Carman was struck. In addition, it was dark in the area, with no artificial lighting available.	Post-accident interviews revealed that the Switch Crew members were unaware that their train had struck the Carman. He was found 45 minutes later, after the other Car Inspector, who had tried to reach the fatally injured Carman by radio, had initiated a search.

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-15-97	Long Island Railroad Co. (LIRR) Nassau, New York Region 1	June 06/05/97 10:40 am, EST	**High Tension Lineman-Apprentice:** 28 years old 2 years of service Last rules trng.: No Record Last safety trng: Daily Last physical exam: 7/25/96	**Craft: MOW** **Positions:** Gang Foreman 2 Linemen Lineman-Apprentice **Activity:** Removal and installation of line boots (electrical connections) and hose from LIRR signal lines.	Lineman-Apprentice lost contact with the tower while ascending, and fell to the ground. Reasons are unknown.	LIRR employees were not trained properly to safely utilize fall protection equipment (e.g. safety belt and harness, rope, and pulley). A variety of methods were used, some not as safe as others.	The tower had no climbing assists (steps or handholds), necessitating free climbing.	
FE-16-97	Central Michigan Railway Company (CMRC) Bay City, Michigan Region 4	June 06/06/97 9:35 pm, EST	**Conductor:** 50 years old 7 years of service Last rules trng: 12/18/96 Last safety trng: 12/18/96 Last physical exam: 10/05/93	**Craft: Transportation** **Positions:** Conductor Engineer Dispatcher **Activity:** Switching	The Engineer failed to stop movement of the train when communication was lost.	The Conductor's radio lacked sufficient voltage to operate in the transmit mode, but the receiving power was sufficient. He had failed to charge his battery prior to use, as was his daily responsibility. Post-accident findings revealed no operational defects with the radio.		

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-17-97	BNSF San Bernardino, CA Region 7	June 06/18/97 3:29 pm, PST	**Track Foreman:** 45 years old 20 years of service Last rules trng.: 5/26/96 Last safety trng.: 10/05/94 **Last physical: No record**	**Craft: MOW** **Positions:** Track Foreman Truck Driver 3 Trackmen Welding Foreman & Driver, BNSF truck tranporting crew members **Activity:** Transport of MOW employees from the job site to the yard at the end of their shift.	The Driver of a 1-ton BNSF truck, transporting five MOW employees south on California Freeway 215, fell asleep at the wheel, causing the truck to overturn. The Driver made a statement that he had started work at 6 am. He had gone to sleep at 9:30 pm the night before and had gotten up at 4:30 am. This information did not indicate fatigue as a result of hours between or during shifts.	The fatally injured Foreman had not been wearing a seatbelt at the time of the accident. A seatbelt may have prevented him from being partially ejected and crushed by the overturned truck.		

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-18-97	UP Portland, OR Region 8	June 06/24/97 4:30 am, PST	**Switch Foreman:** 53 years old 28 years of service Last rules exam: 6/12/95 Last safety trng.: 10/18/96 Last physical exam: 10/93	**Craft: Transportation** **Positions:** Engineer Switch Foreman Helper Yardmaster **Activity:** Switching	The Switch Foreman was struck by a moving car after placing himself between cars to release a hand brake.	A post-accident inspection of the next-to-last car of the cars being moved revealed that the hand brake had been applied. Post-accident investigators concluded that the Foreman, while trying to release the hand brake from the preceding car, either fell from a position on the trailing end of the car or had placed himself between the cars and lost his footing. He then was struck by the following car.		

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-19-97	NS Rowesville, SC Region 3	June 06/24/97 8:58 pm, EST	**Conductor:** 21 years old 2 ½ years of service Last rules trng.: 2/03/97 Last safety trng.: 5/21/97 Last physical: 01/95	**Craft:** **Transportation** **Positions:** Conductor Engineer Dispatchers Yardmaster **Activity:** Switching	The Conductor did not insure the switch was in the proper position prior to authorizing the train to make a reverse movement. The Conductor's failure to properly line the main track switch resulted in the cars re-entering the siding and striking him in the back.	The Conductor was not vigilant while walking on the track.	The Conductor was inexperienced and had established a pattern of careless behavior: He had only 2 ½ years service and had been suspended for 15 days for a run-thru switch in December.	The accident had occurred at 8:58 pm; however, the Orangeburg County Emergency Medical Service did not receive a call until 10:06 pm! The delay resulted when the Train Dispatchers had difficulty identifying and notifying the appropriate emergency service provider for their jurisdiction. NS's own police department, which could have facilitated the process, received a delayed notification.

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-22-97	Metro North Commuter Railroad Company (MNCW) Stamford, CT Region 1	July 07/18/97 1:29 am, EST	**Conductor/Flagman:** 40 years old 7 years, 7 months service Last rules trng.: 3/11/97 Last safety trng.: 8/14/94 Last physical: 1/24/97	**Craft: Transportation** **Positions:** **Catenary Pole Work:** Conductor working as a Flagman for private contractor & Contractor Foreman Apprentice Groundman Groundman **Train 543:** Engineer Conductor Asst. Conductor **Train 1507:** Conductor who reported body 1 ½ hours after the Contractors had left the work site. **Activity:** Installing catenary poles	Conductor/Flagman failed to remain clear of the main track.	The Catenary Pole Erection Work Procedures required foul time and flagging protection when fouling adjacent track or overhead utility lines. The Flagman was responsible for arranging this. A review of the train sheets for the New Haven Line disclosed that **no foul time had been requested.**	The Engineer of Train 543 indicated that he had dimmed the train's headlights because he saw two track vehicles illuminating the work area. It was estimated that the illumination of headlights on high beam would have added 10 seconds to the 26 seconds sight distance of the Flagman.	Although it probably did not contribute to the death of the Conductor/Flagman (who probably died instantly), the Contractors were negligent in leaving the work site without locating the missing Flagman. **The Conductor of Train 1507 reported discovering the body 1 ½ hours after the contractors had left the scene.**

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-22-97 CONT.					**PCF NO. 4** The event recorder disclosed that the Engineer of Train 543 did not sound the horn. During a re-enactment, the Post-Accident Investigators found that the diesel generator on the Contractor's truck prevented them from hearing the train until it was 20-30 feet from the accident site. Therefore, sounding the horn could have helped alert the Flagman.	**PCF NO. 5** Operating with the long hood forward diminished the sight distance of the Train Crew, who apparently kept going, unaware that someone had been hit.	**PCF NO. 6** The Conductor/ Flagman's last safety training was in 1994. Only two of the Contractor's personnel had been trained in Roadway Worker Safety.	
FE-22-97 CONT.					**PCF NO. 7** The Conductor/ Flagman did not comply with MNCW's Operating Rule No. 35, which required that he have a flashlight or fusees with him.			

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-23-97	St. Lawrence & Hudson Railway (subsidiary of the Canadian Pacific Railroad) Binghamton, NY Region 1	July 07/24/97 3:50 am, EST	**Carman:** 53 years old 29 yrs., 7 mos. of service Last rules trng.: 03/96 Last safety trng: 01/97 **No record of physical**	**Craft: MOE** **Positions:** **Carmen crew:** Carman Co-worker Yardmaster **Yard Switcher Job YBHS-66:** Engineer Conductor Brakeman **Train 268:** Crew members not identified. Their train received an air brake test before departure. **Activity:** Inspecting cars; air brake tests; applying EOT device; and switching at the same time.	The fatally injured Carman did not provide blue signal protection while working on railroad equipment to protect himself from the unexpected switching movement to outbound Train 269, during Switching Job YBHS-66. He had flagged Track No. 5 for car inspections, but he displayed no blue signals at either end of the cars on the No. 1 runner, which would have alerted the Switching Crew of his intentions prior to applying the EOT device. The Switching Crew was unaware of the Carman's presence.	The fatally injured Carman had received training in the proper application of blue signal protection in March 95 and March 96; however, he had been disciplined in the past for not applying the blue flag rule.		

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-25-97	UP Elko, Nevada Region 7	August 08/15/97 3:30 am, PST	**Switchman:** 53 years old 28 years of service Last rules trng.: 09/03/96 Last safety trng.: 08/23/96 **Last physical: 08/90**	**Craft:** **Transportation** **Positions:** Engineer Switch Foreman Switchman **Activity:** Switching	When trying to adjust the coupler drawhead, the Switchman was pinned between the rest of his consist and the unexpectedly returning 3-car cut. Last three cars of the consist had misaligned couplers. They rolled away while other cars in the consist were being coupled. As the Switchman attempted to adjust the coupler on the fourth car from the rear of the consist, the 3-car cut rolled back toward him.	Two drawbars the Switchman handled needed oiling and were hard to move, causing the process to take longer than usual.		Post-accident toxicological test results for the deceased were negative, so this was not a PCF. However, FRA cited the carrier for violations re: (49 CFR Part 219, Subpart C). The proper form was not completed; samples were not collected promptly; and the carrier did not make the kit available immediately.

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-27-97	BNSF Barstow, CA Region 7	September 09/12/97 11:25 am, PST	**Lineman/Communication Specialist:** 63 years old 20 yrs. 3 mos. of service Last rules trng: 05/26/96 Last safety trng: 05/08/97 **Last physical:** **Pre-employment**	**Craft: MOW** **Positions:** Lineman/ Communication Specialist & Team of Trainmen who monitored speed of cars off hump & Humpmaster **Activity:** Repair of head-end telemetry and EOT devices, and replacement of malfunctioning radio.	Failure of the motor vehicle operator (Lineman) to yield the right-of-way to a moving cut of freight cars descending the hump.	Lack of signage or other warning to motorists, instructing them to obtain authorization from the hump tower before using the private grade crossings which provided access to the bowl track area.		Blood specimens harvested from the deceased under FRA authority were mailed to lab personnel, who found the vials broken upon arrival; the testing was canceled. Fortunately, the San Bernardino County Coroner's Office conducted tests under its own authority and released the results which were negative.

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-30-97	NS Chicago, IL Region 4	October 10/07/97 2:13 pm, CST	**Railroad Special Agent:** 56 years old 24 years of service Last rules trng.: 8/06/97 Last safety trng: 8/06/97 Last physical: 1/15/97	**Craft: Other (Not Contractor)** **Positions:** NS Special Agent **Metra Commuter Train 7:** Engineer Conductor Asst. Conductor **Activity:** While patrolling and providing police protection for NS property, the Special Agent responded to a call regarding a trespasser suspected of attempting to board NS Freight Train 268, which was being assembled in Landers Yard.	The Railroad Special Agent, as the motor vehicle operator, did not yield the right-of-way to the oncoming Metra train at a private highway-rail grade crossing. If he had stopped at the STOP sign at the crossing, the motorist would have seen and heard the oncoming train in time. The Engineer sounded the train horn 138 feet from the crossing, providing the motorist 11 seconds to respond. This was determined adequate. In addition, the motorist should have seen the train beforehand since he was traveling a road parallel but in the opposite direction of the train. Also, it was mid-afternoon.			

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-31-97	National Passenger Rail Corporation (ATK) Concord, MA Region 1	October 10/10/97 12:01 pm, EST	**Swingmaster Operator:** 51 years old 27 years of service Last rules trng.: 5/20/97 Last safety trng.: 3/25/97 **Last physical: No Record**	**Craft: MOW** **Positions:** **MOW and Yard staff:** Swingmaster Operator Track Foreman Trackman Inspection & Repair Foreman Asst. I&R Foreman Roadmaster Concord Civil Engineer Tower Director Tower Trainee Dispatcher **Passenger Train 421:** Engineer Conductor Asst. Conductor **Activity:** Track maintenance: Adding rubber panels to the east edge of a highway-rail grade crossing.	The Track Crew used a procedure to foul the track which did not comply with the carrier's operating or safety rules. The I&R Foreman and Tower Operator did not comply with ATK's operating rules of 3/8/90: "All information governing permission to use track (foul time, movement via signal indication within interlockings, and form "D" permits) will be issued on the road radio channel." A memo was posted at Waltham Tower. The I&R Foreman and Tower Operator used the engineering channel for all communication, while the Track Foreman was listening to the road channel.	The configuration of the swingmaster's seat, with movable armrests installed, may have hindered the Operator from leaving the site. He was not wearing seatbelts, which would have caused an additional delay in this situation.	Miscommunication occurred between the Track Foreman and the Waltham Tower Operator who told the Foreman it was acceptable to work with the I&R Foreman at Sudbury Road under his authority. The Foreman thought this message implied that it was OK to foul the tracks, when that clearance had not yet been given. The Foreman therefore erroneously gave instructions to the Swingmaster Operator to proceed.	

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-32-97	Montana Rail Link (MRL) Laurel, MT Region 8	October 10/16/97 10:20 pm, MST	**Switchman:** 22 years old 10 mos. of service Last rules trng.: 4/15/97 Last safety trng.: 9/19/97 Last physical: 4/15/97	**Craft:** **Transportation** **Positions:** Switchman Switch Foreman Locomotive Engineer **Activity:** Switching	The Switchman unexpectedly fell from the end of the car onto the track structure while applying a hand brake during a shoving movement.	The surface area of the brake step was damaged, which decreased the area of footing: FRA inspectors found the width of the brake step to be inadequate for safety. The width of the brake step had a graduating bend inward up to two inches in the area directly below the hand brake assembly. This graduated bend area extended for 30 inches.	The Switchman had limited experience.	

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-33-97	ATK Darby, PA Region 2	November 11/04/97 11:32 am, EST	**Carpenter, Structures (also Northernmost Watchman):** 45 years old 20 yrs. 10 mos. of service Last rules trng.: 8/16/96 Last safety trng.: 1/17/97 **Last physical: N/A**	**Craft: MOW** **Positions:** **Yard Staff:** 4 Watchmen for Gangs C312 and C102 2 Bridge & Bldg. (B&B) Foremen for Gangs C312 and C102 **Septa Train No. 4634 (Passenger Train):** Engineer Conductor **Activity:** Installing and replacing inter-track fencing between two main tracks.	Northernmost Watchman failed to remain clear of the tracks.	The northernmost Watchman was under the influence of alcohol, per post-accident toxicological test results.	The Foremen did not comply with 49 CFR Part 214.315 (d), the Federal Roadway Worker Protection Standards, which requires that the same person who provides on-track protection brief the other employees. The Foreman who was qualified on the characteristics of the area provided on-track protection but did not give the briefing. The Foreman-in-Charge did. Consequently, employee interviews and job briefing document sheets revealed conflicting information re: train speeds, NORAC's Operating Rule 261 (i.e. Signal indication will be the authority for a train to operate in either direction on the same track.), and the possibility of 2-way traffic on each track.	

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-33-97 **CONT.**					**PCF NO. 4** The Foremen repeatedly failed to notify the Watchmen of train movements: The first two times that foul time was obtained and released for Tracks Nos. 1 and 2, only one Watchman was notified. Foul time was obtained and released two more times, the last time a few minutes before the accident, without notifying Watchmen.	**PCF NO. 5** According to post-accident interviews, although gang members were aware they were in Rule 261 territory, they were still surprised to see Septa Train 4634 approaching northbound on Track No. 4. This further supports the need for better communication regarding train movements.		
FE-35-97	CSX, Transp., Inc. (CSX) Fairmont, West VA Region 2	August 08/17/97 8:59 pm, EST	**Brakeman:** 24 years old 1 yr. 7 mos. of service Last rules trng.: 1/10/97 Last safety trng.: No record Last physical: 2/13/96	**Craft: Transportation** **Positions:** Brakeman & Tractor-Trailer Driver (not CSX employee) **Activity:** The Brakeman was en route to training from his parents' home. He was driving his own vehicle.	A Tractor-Trailer Driver lost control of his truck, crossed the median, and struck the Brakeman's vehicle head-on, causing a 4-vehicle highway collision.	It was dark and raining heavily.	At 60 mph, the Tractor-Trailer Driver was exceeding a safe speed for poor weather conditions.	

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-36-97	BNSF Emporia, KS Region 6	December 12/02/97 7:45 pm, CST	**Conductor:** 50 years old 30 years of service Last rules trng.: 5/18/95 Last safety trng.: 5/18/95 Last physical: 7/21/92	**Craft:** **Transportation** **Positions:** **Train L-KAN-0031-02:** Engineer Conductor Brakeman **Thru-Train Z-ALTWSP8-02:** Engineer Conductor Yardmaster **Activity:** Switching	The Conductor was standing foul of Track No. 2 and did not move in the clear when an on-coming train approached.	The entire Crew was in non-compliance with CSX's operating rules prohibiting the combination of radio and hand-signal communication, which can create confusion.		

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-40-97	CSX Ashford, AL Region 3	December 12/09/97 12:12 pm, CST	**Electrician:** 54 years old 27 years of service Last rules trng.: unknown Last safety trng.: unknown Last physical: unknown (The last three items are not relevant to this type of accident. FRA depended on police reports, which would not include the above data.)	**Craft: MOE** **Positions:** Electrician Truck Driver (not CSX employee) **Activity:** Traveling from job site, after completing electrical job, in a company vehicle.	A CSX Electrician was traveling from the job site in a company vehicle when another motorist of a pick-up truck went through a STOP sign and struck the CSX truck in the left rear, causing it to roll over.			

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-41-97	NS Ridgeway, SC Region 3	December 12/09/97 2:20 pm, EST	**Trackman:** 39 years old 13 years of service No other data (FRA received information from a police report; therefore, data on training, etc. was not available and did not apply to this case.)	**Craft: MOW** **Positions:** Trackman Truck Driver (not NS employee) **Activity:** En route from safety meeting to job site in his personal vehicle.	A Trackman, traveling southbound in his personal vehicle, crossed into the path of a southbound pick-up truck and was struck while attempting a left turn. The Driver of the pickup truck attempted to pass the Trackman's vehicle in a designated passing zone. When the Trackman attempted to make a left turn onto a private road, he impeded the path of the pickup truck.			

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-42-97	Grand Trunk Western Railway Company Lake Orion, MI Region 4	December 12/10/97 11:45 am, EST	**Crane Operator:** 47 years old 27 years of service Last rules trng.: 02/97 Last safety trng.: 02/97 Last crane operating trng.: 11/95 Last physical: 06/97	**Craft: MOW** **Positions:** Track Foreman Crane Operator 3 Trackmen **Activity:** Aligning new track with crane.	The Crane Operator did not utilize the crane's outriggers (stabilizers) while attempting to lift and swing excessive weight.	Stabilizers should always be used; however, the condition of the track necessitated their use more than usual: The crosslevel of the rails measured a 2 ½-inch deviation from 0, while the void under the ties was 4 3/4 inches. The track lacked ballast. It was essentially just rails and ties. The Foreman indicated he had discussed this with the Crane Operator who said "skeletonized track should move fairly easily." This may have been the case with stabilizers, which were not used.	The ground, which was soft and muddy because of new track construction, contributed to the incident.	

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-43-97	UP Topeka, KS Region 6	December 12/11/97 5:05 am, CST	**Locomotive Engineer:** 46 years old 23 years of service Last rules trng.: 5/31/96 Last physical: 5/13/97 Last efficiency test: 12/05/97 Last Engineer re-certification: 7/10/95 (According to Federal regulations, Locomotive Engineers need to be certified every three years. This Engineer was in compliance.)	**Craft:** **Transportation** **Positions:** **Train MSIKCX-10** Locomotive Engineer Conductor **Train CBTAC-09** Locomotive Engineer Conductor Manager of Train Operations **Activity:** Switching	The Locomotive Engineer of Train MSIKCX-10 failed to observe an oncoming train on the adjacent track and was struck by Train CBTAC-09 after dismounting his locomotive.	Interviews with the Crew of Train CBTAC-09 confirmed that the locomotive auxiliary (ditch) lights were not on. The Engineer stated that he dimmed the headlight to avoid blinding the crew on the adjacent track.	The Engineer did not sound the train horn as he approached the east end of Train MSIKCX-10. ***A train horn could have helped since the fatally injured Engineer's back was toward the oncoming train.***	

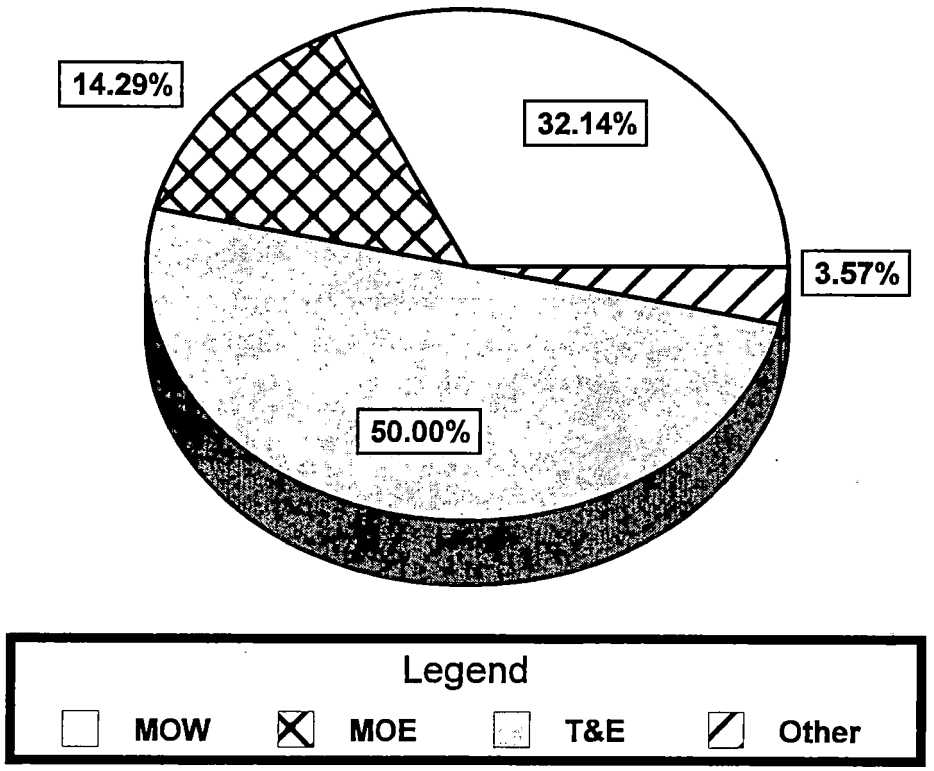
REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-43-97 CONT.					PCF. NO. 4 The Conductor of Train MSIKCX-10 only saw the ongoing train 25 feet away or 5 seconds from the point of impact, according to the interview. He attempted to warn the Locomotive Engineer by yelling out the door of the lead locomotive's cab.	PCF. NO. 5 The fatally injured Engineer was referred to as a "big man," at 5 feet 9 inches and 375 pounds. His size may have placed him too close to the adjacent track, and slowed down his reaction time when the train approached. The area between adjacent tracks would have been narrow, especially when exiting a locomotive.		

REPORT	RAILROAD, LOCATION & REGION	MONTH, DATE & TIME	FOR FATALLY INJURED EMPLOYEE: Age & Yrs of Service Last Training and Type Last Physical Last Drug Test	FOR ALL EMPLOYEES: CRAFT POSITIONS ACTIVITY	PCF NO. 1	PCF NO. 2	PCF NO. 3	NOTE
FE-45-97	UP Boise, ID Region 8	December 12/26/97 5:45 pm, MST	**Conductor:** 55 years old 32 years of service Last rules exam: 5/02/97 Last safety trng.: 5/02/97 **Last physical: 2/22/91**	**Craft:** **Transportation** **Positions:** Engineer Conductor Brakeman **Activity:** Switching	Post-accident evidence indicated that the Conductor was between a tank car and box car, and in the process of uncoupling the two cars, when he was struck.	Crew Members did not clearly convey their intentions during radio transmissions for the movement of the train. **UP's radio procedures were not followed. Three errors were committed:** 1) The Brakeman did not give a specific distance for a pushing move. 2) The Engineer executed the move without receiving a specific distance. 3) Neither contacted the Conductor prior to the shoving move.		

APPENDICES
(B-I SERIES)

APPENDIX B

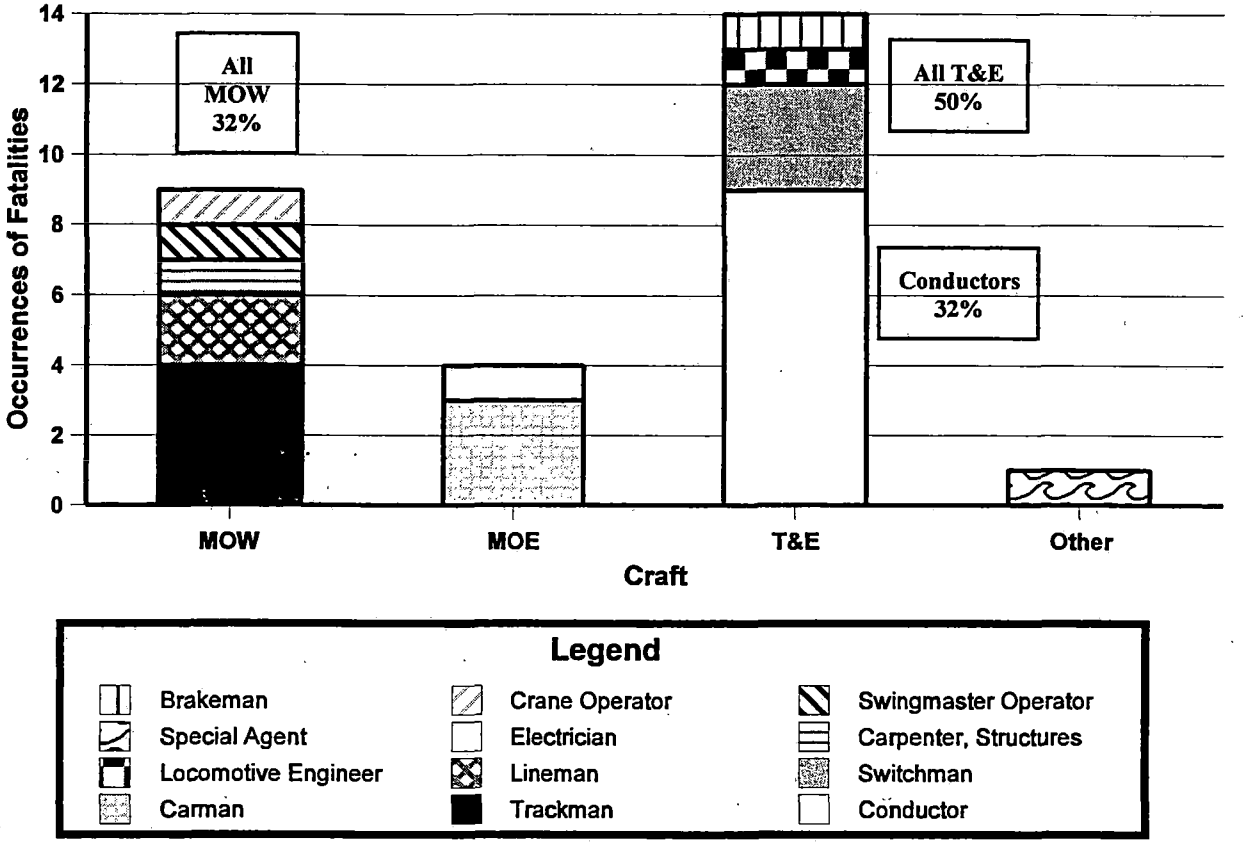
1997 Railroad Employee Fatalities
By Craft



APPENDIX C

1997 Railroad Employee Fatalities

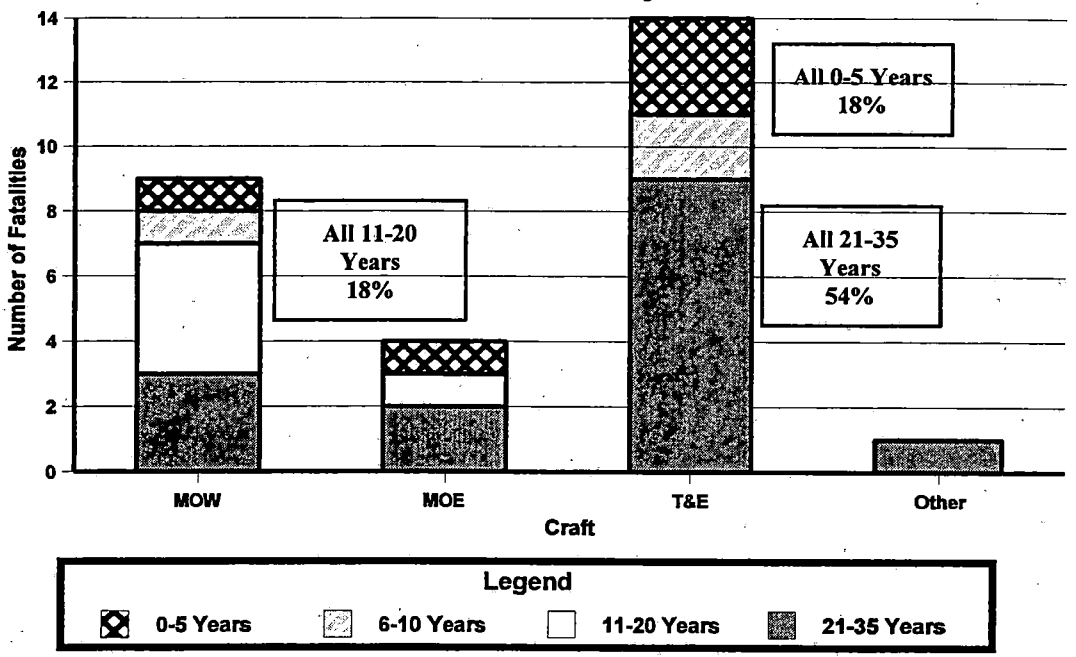
By Craft and Position



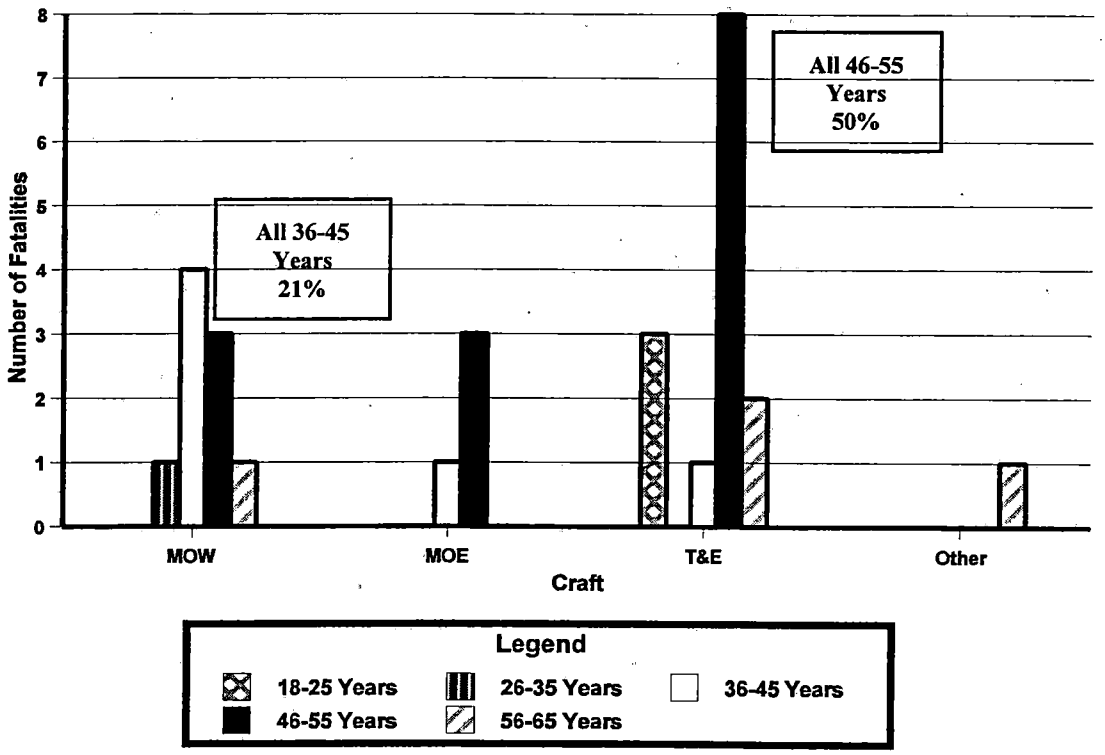
APPENDIX D

1997 Railroad Employee Fatalities

Years of Service by Craft

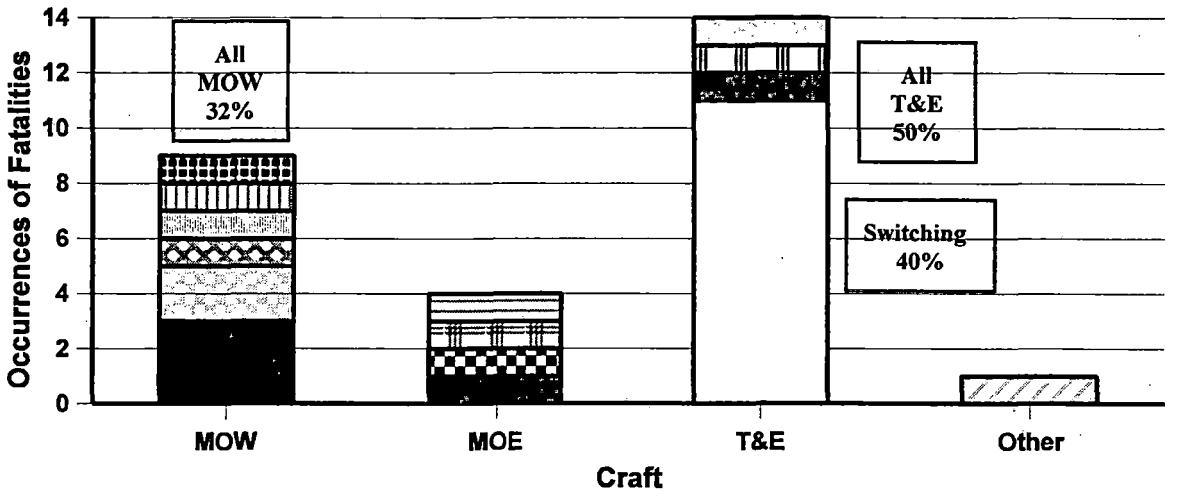


Age Ranges by Craft



1997 Railroad Employee Fatalities

By Craft and Activity



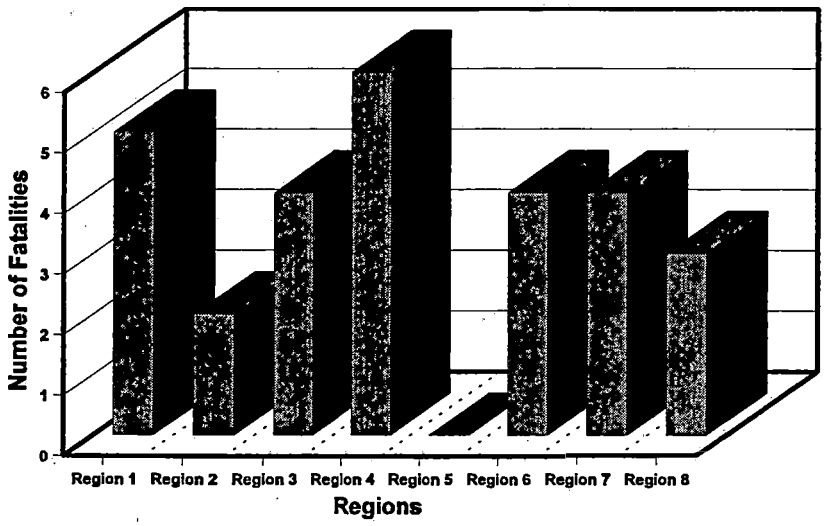
Legend

- Applying EOT Device
- Enforcement
- Installing Inter-track Fencing
- Blue Flag
- Cleaning/salting Switches
- Track Maintenance
- Switching
- Aligning Track
- Installing Signal Line Boots & Hose
- Installing Catenary Poles
- Crew Change
- Car Inspections
- En Route

APPENDIX F

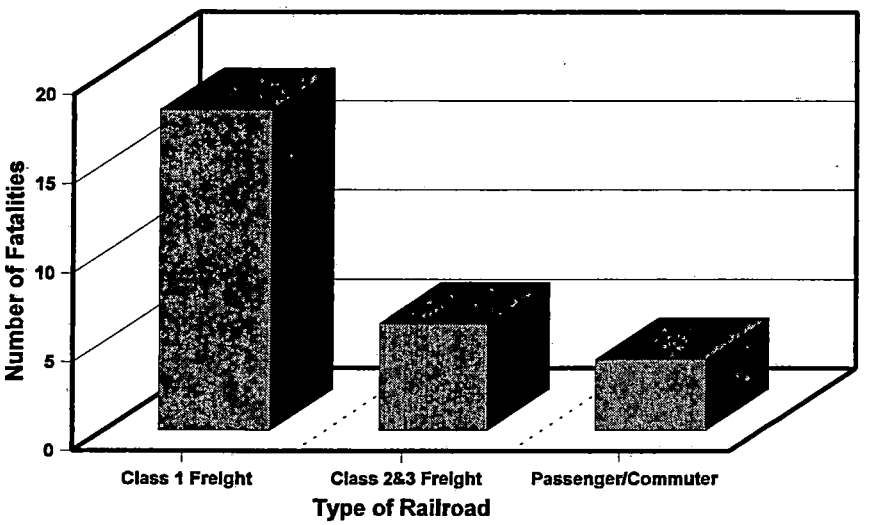
1997 Railroad Employee Fatalities

By FRA Region



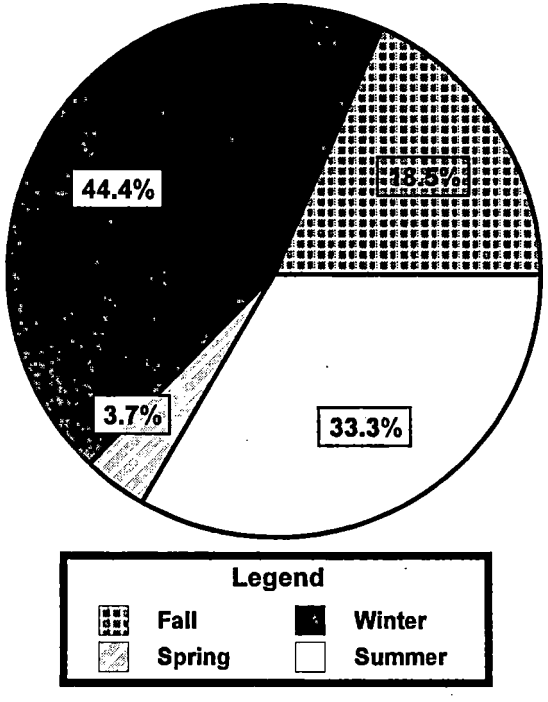
1997 Railroad Employee Fatalities

By Type of Railroad

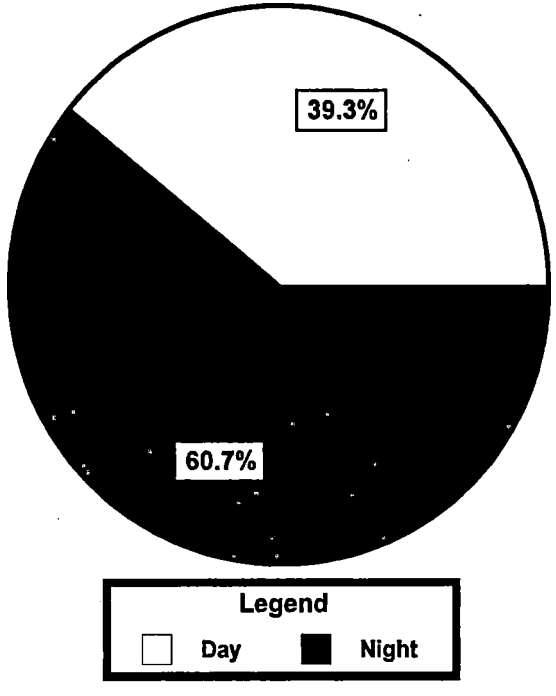


1997 RAILROAD EMPLOYEE FATALITIES

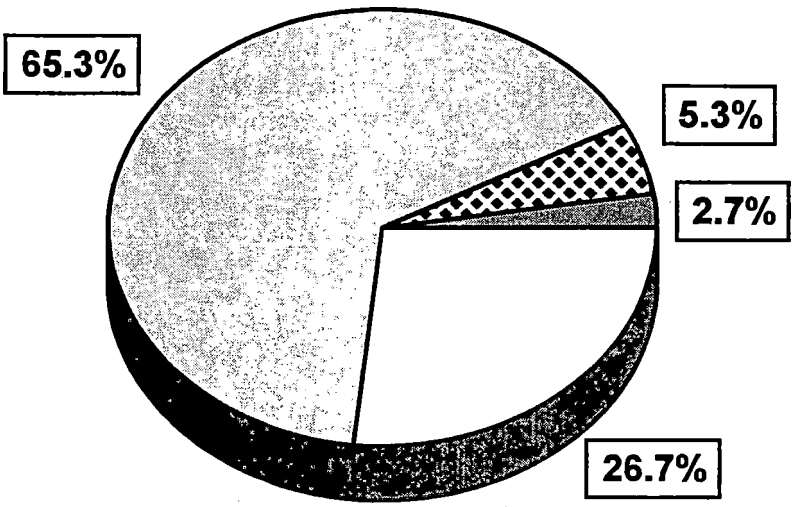
By Season of Year



By Time of Day

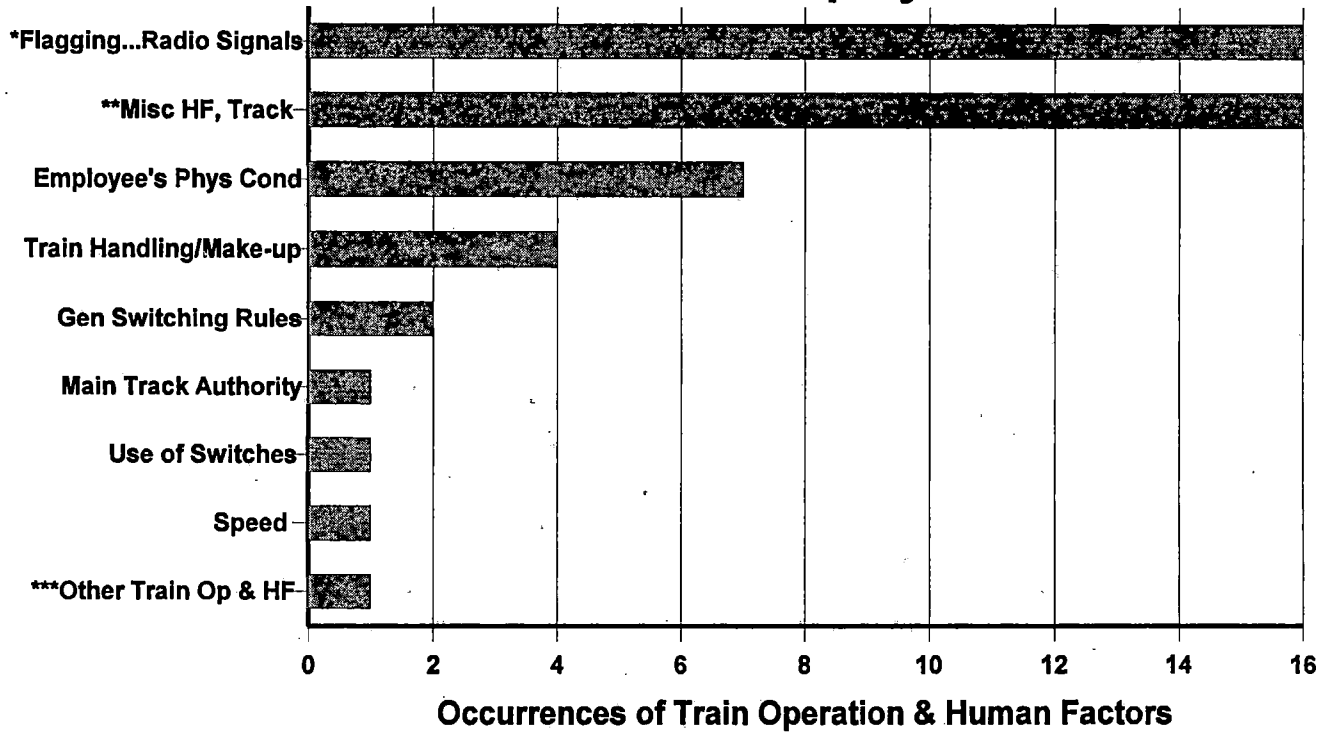


Major Possible Contributing Factor Categories
Involved in 1997 Railroad Employee Fatalities



Train Operation & Human Factor Categories

Involved in 1997 Railroad Employee Fatalities



* "Flagging, Fixed, Hand & Radio Signals" is the full category name.
** "Miscellaneous Human Factors, Track" is the full category name.
*** "Other Train Operations & Human Factors" is the full category name.

Note: See Appendix J-2, next page, for a detailed index of ALL Train Operation & Human Factors which made up the above categories in 1997.