

RAILROAD ACCIDENT INVESTIGATION

Report No 4006

THE ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

YAMPAL, ARIZONA

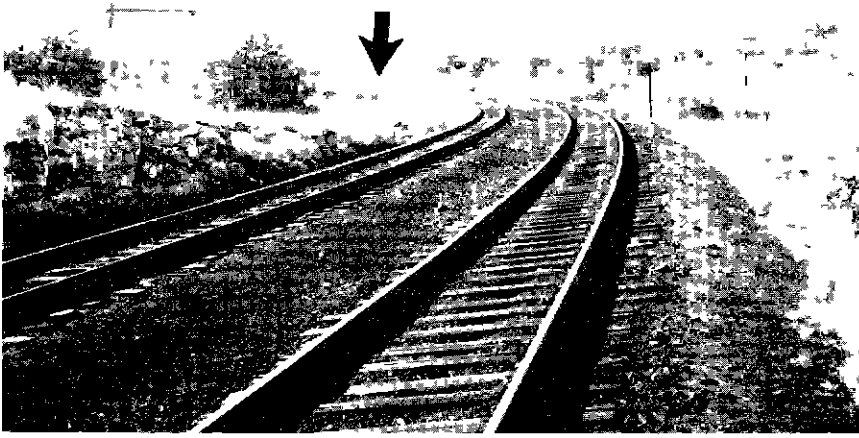
JANUARY 2, 1964

INTERSTATE COMMERCE COMMISSION

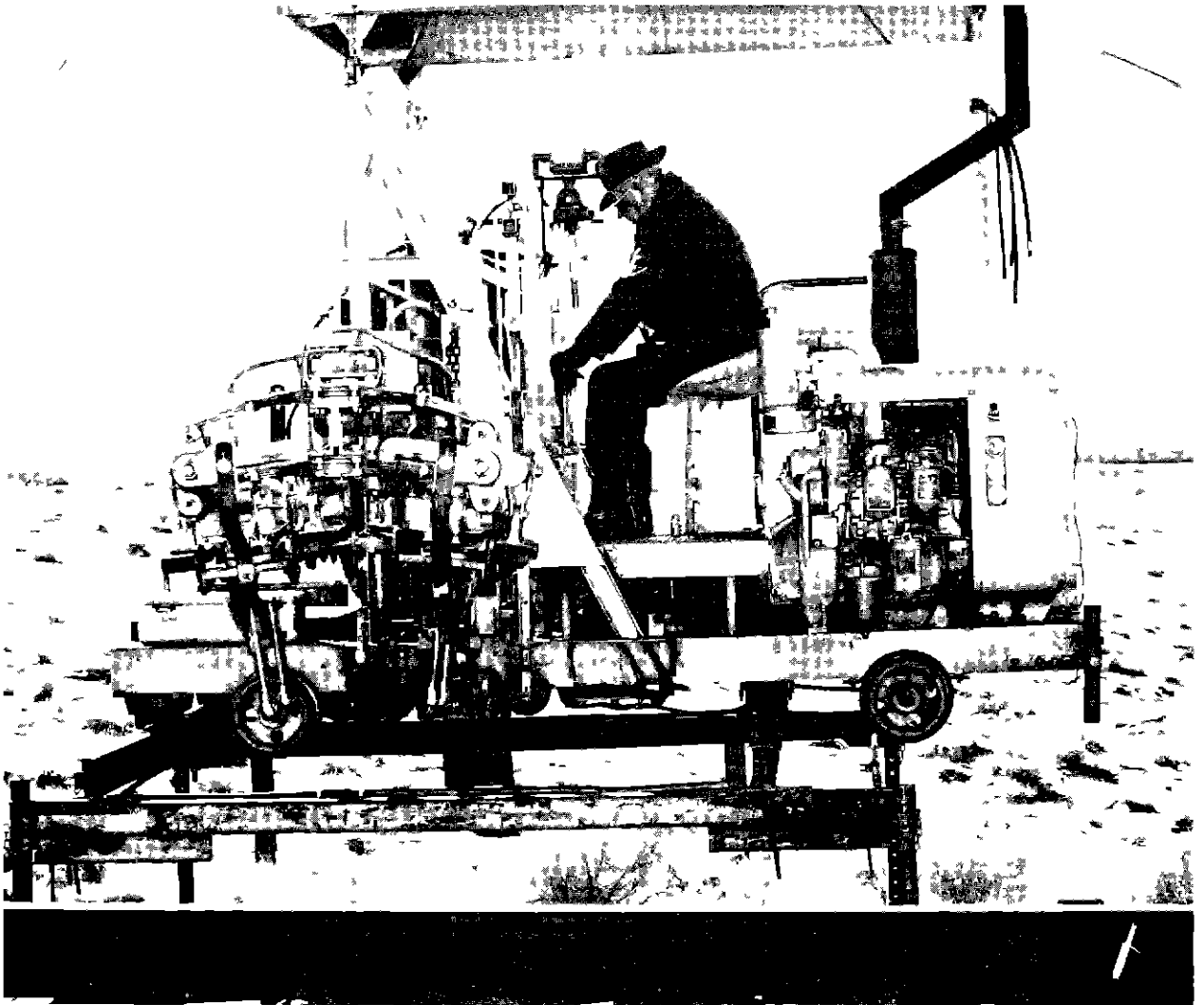
Washington

S U M M A R Y

DATE	January 2, 1964	
RAILROAD	Atchison, Topeka and Santa Fe	
LOCATION	Yampai, Arizona	
KIND OF ACCIDENT	Collision	
EQUIPMENT INVOLVED	Two maintenance-of-way on-track machines	Freight train
TRAIN NUMBER		Extra 963 West
LOCOMOTIVE NUMBERS		Diesel-electric units 963, 967, 908, 902, 977, 934
CONSIST		54 cars, caboose
SPEEDS	Standing	47 m p h
OPERATION	Signal indications	
TRACK	Double, tangent, 1 37 percent descending grade westward	
WEATHER	Clear	
TIME	12 32 p m	
CASUALTIES	4 killed	

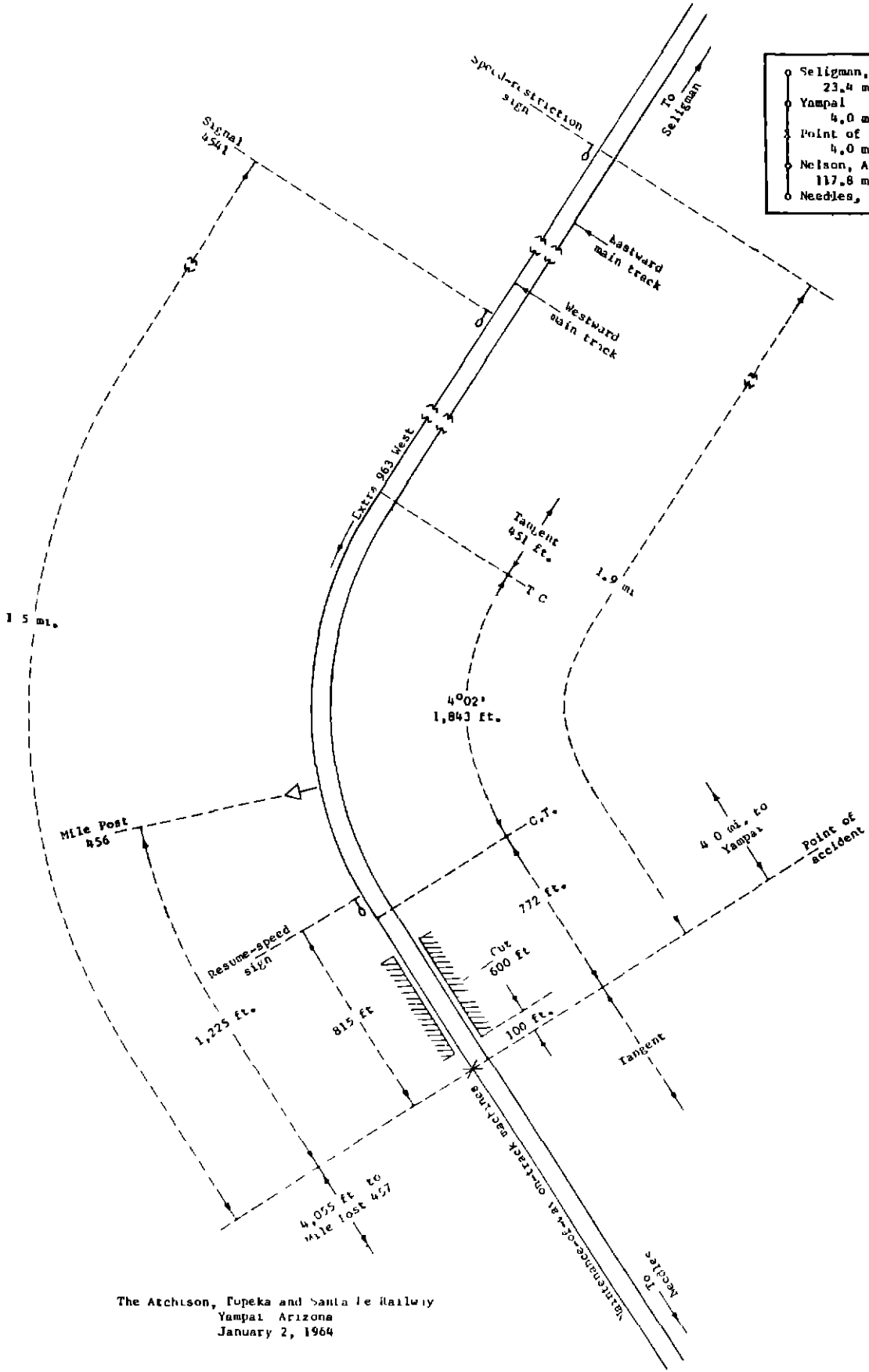


View westward toward point of accident (arrow)



Combination jack and tie-tamping machine on portable set-off This machine is similar to one of the maintenance-of-way machines involved

- Seligman, Ariz. 23.4 mi.
- Yampal 4.0 mi.
- × Point of accident 4.0 mi.
- Nelson, Ariz. 117.8 mi.
- Needles, Calif



The Atchison, Topeka and Santa Fe Railway
 Yampal Arizona
 January 2, 1964

INTERSTATE COMMERCE COMMISSION
SAFETY AND SERVICE BOARD NO 1

RAILROAD ACCIDENT INVESTIGATION

Report No 4006

THE ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

Synopsis

About 12 32 p m , January 2, 1964, a westbound freight train on the Atchison, Topeka and Santa Fe Railway struck two maintenance-of-way on-track machines on the westward main track near Yampai, Ariz. Two trackmen and the operator of each maintenance-of-way machine were killed.

This accident was caused by failure of a track foreman to keep maintenance-of-way on-track equipment clear of the track in a designated area over which a closely approaching train, after prior identification and communication with the track force involved, was authorized to proceed at speed.

Location and Method of Operation

The accident occurred on that part of the Albuquerque Division extending between Seligman, Ariz and Needles, Calif , 149.2 miles. Near Yampai, Ariz , 23.4 miles west of Seligman, the railroad is a double-track line. Trains moving with the current of traffic are operated by signal indications of an automatic block-signal system.

The accident occurred on the westward main track 4 miles west of Yampai station.

Details of the track structure, operating rules, maintenance-of-way rules, and maintenance-of-way equipment involved are described in the appendix.

Description and Discussion

On January 1, 1964, the foreman of a track force designated as Gang No. 3 submitted the following message to the operator at Seligman:

~~EFFECTIVE THURSDAY JAN TWO (2) BETWEEN EIGHT NAUGHT ONE (8 01AM) AND THREE-THIRTY (3 30PM) HAVE ALL TRAINS ON WESTWARD TRACK APPROACH TRACK GANG NUMBER THREE (3) WORKING BETWEEN MP FOUR-FIFTY-SIX (456) AND MP FOUR-FIFTY-SEVEN (457) BETWEEN YAMPAI AND NELSON KINGMAN DISTRICT PREPARED TO STOP UNTIL PROPER PROCEED SIGNAL RECEIVED, AFTER RECEIVING PROCEED SIGNAL TRAIN MAY RESUME NORMAL SPEED~~

About 7 00 a m , the following day, Gang No 3, consisting of the foreman, three on-track machine operators and five trackmen, reported for duty at Yampaí. Soon afterward, the foreman telephoned the operator at Seligman and received a line-up of train movements. In addition, he was informed ~~by the operator~~ of train order No. 600, which read in part as follows

EIGHT-NAUGHT-ONE 801AM TO THREE-THIRTY 330PM TRAINS ON WESTWARD TRACK APPROACH GANG NO 3 BETWEEN MP 456 AND MP 457 BETWEEN YAMPAI AND NELSON PREPARED TO STOP UNTIL PROPER PROCEED SIGNAL RECEIVED THEN RESUME NORMAL SPEED

Gang No 3 departed from Yampaí about 7 30 a m and drove 3 8 miles westward to the railroad right-of-way near Mile Post 456. Their on-track equipment had been left there clear of the track on the previous work day. This equipment consisted of a combination jack and tie-tamping machine, a tie-tamping machine, a track-lining machine, and a push car.

About 8 00 a m , the track force placed the three on-track machines and the push car on the westward main track in the block of signal 4541 and began resurfacing the track westward between Mile Posts 456 and 457. The push car was insulated to prevent shunting of track circuits and the other equipment was non-insulated. The foreman telephoned the operator at Seligman about 9 45 a m to inquire about line-up revisions. He was instructed that the line-up had been revised and that both Extra 963 West and Extra 920 West on the revised line-up would leave Seligman about 11 40 a m. The operator also advised that it was not known which train would depart first. Approximately two hours later, the foreman instructed the trackmen and operators of the on-track machines to clear the westward main track for their lunch period. The machines were moved clear of the track onto portable set-offs placed on the north side of the track structure about 1,225 feet west of Mile Post 456 and the push car also was removed from the westward main track. Two eastbound freight trains, Extra 803 East and Extra 917 East, passed on the eastward main track, while members of the track force were eating lunch in the vicinity of the maintenance of way equipment.

After the lunch period had ended the foreman used the portable telephone to communicate with the train dispatcher, and while on the telephone he overheard the operator at Seligman reporting to the dispatcher that Extra 963 West had departed from that point at 12 01 p m. Apparently the foreman gained the impression when he overheard this report that the time was then 12 01 p m. and erroneously concluded there would be sufficient time for the track force to work for a period of 15 or 20 minutes before it would be necessary to clear the westward main track for Extra 963 West. According to the

train dispatcher, it was 12 15 p m when he had the telephone conversation with the track foreman during which he issued two supplements to the line-up, one of which covered the departure of Extra 963 West at 12 01 p m and the other which indicated that Extra 920 West should leave Seligman at 12 45 p m. The track foreman said after this conversation with the train dispatcher he attempted to call the crew of Extra 963 West by means of the radio-telephone equipment on the tie-tamping machine but did not hear any response because of excessive static. He said he did not communicate by radio-telephone with any crew member of Extra 963 West prior to the accident, and could not recall having stated over the radio-telephone at any time that the on-track equipment of Gang No 3 had cleared the westward main track for this train.

Two or three minutes after conversing with the train dispatcher at the end of the lunch period, the foreman instructed members of the track force that immediately after a passing eastbound train cleared this location they were to replace the tie-tamping machine and the combination track-jack and tie-tamping machine on the westward main track and resume work. He said he then obtained a yellow flag and proceeded to a point on the track structure about 300 feet east of these machines. Track curvature and the south wall of a cut restricts the view eastward from this point. The foreman said he first observed Extra 963 West approaching at a distance of approximately 600 feet, while members of the track force were moving the two machines onto the track. A few seconds after the train came into view it struck successively the tie-tamping machine and the combination track-jack and tie-tamper which were about 39 feet apart prior to the collision. Both on-track machines were derailed and destroyed. The operator of each machine and two trackmen were killed.

The track force survivors said the foreman had not told them of the contents of the line-up, prior to the accident. One trackman said that before the two on-track machines were replaced on the westward main track at the end of the lunch period, he observed the foreman using the radio-telephone on the tie-tamping machine but did not overhear what was said. According to his statements, the three machine operators and the five trackmen were engrossed in replacing the two on-track machines on the westward main track as Extra 963 West closely approached and were unaware of the train before the collision.

Before Extra 963 West departed from Seligman, the crew members received copies of train order No 600 with a message reading

**YOU ARE AUTHORIZED TO MAKE PASSENGER TRAIN
SPEED WITH A MAXIMUM NOT TO EXCEED 70 MPH**

This train, consisting of 6 diesel-electric units, 54 cars and a caboose, departed from Seligman at 12 01 p m and passed Yampa about 12 27 p m. The engineer said that while approaching Yampa, he heard a voice over the radio-telephone announce Gang No 3 was calling Extra 963 West. He said that in response to this call, he identified his train and announced it was near Yampa. He said the voice over the radio-telephone replied that Gang No 3 was clear of the westward main track and gave Extra 963 West a verbal proceed signal. He said he acknowledged receipt of this signal by again identifying his train and announcing he understood Gang No 3 was clear of the westward main track.

Extra 963 West passed Yampa and approached the point of accident at a speed of 55 miles per hour, as indicated by the speed-recording tape. It was moving at this speed when it passed a temporary slow signal for westbound trains. It then passed signal 45-1, which displayed a Clear aspect, and reduced speed to 50 miles per hour as it entered the curve to the left located a short distance east of the point of accident. The engineer said he sounded the horn of the locomotive while the train proceeded on this curve. As the locomotive approached Mile Post 456 and the temporary resume-speed sign located near the west end of the curve, the engineer, fireman and front brakeman observed the two maintenance-of-way on-track machines on the westward main track a short distance ahead. The engineer promptly initiated an emergency application of the brakes and the front brakeman sounded the locomotive horn. The speed was reduced to about 47 miles per hour before the collision occurred.

The train stopped with the front end 1,693 feet west of the point of accident. None of its equipment was derailed. The front of the locomotive was slightly damaged. No member of the crew was injured.

Statements of the fireman and the front brakeman corroborated those made by the engineer. None of the crew members recalled observing the track foreman before the accident.

The flagman, swing brakeman, and conductor of Extra 963 West, and all the crew members of Extra 803 East and Extra 917 East, said they overheard someone informing the engineer of Extra 963 West by radio-telephone that Gang No. 3 was in the clear and give him a verbal proceed signal.

The train dispatcher said the track foreman telephoned him soon after the accident and stated he had communicated by radio-telephone with Extra 963 West when this train was near Yampa. According to the dispatcher, the foreman stated he told the crew of Extra 963 West that Gang No. 3 was clear of the westward main track and later discovered that one of the on-track machines was on the westward track. According to the dispatcher, the foreman stated he then called Extra 963 West by radio-telephone to warn his train about the on-track machine fouling the westward main track, but received no response to his call.

In the territory where the accident occurred temporary slow and resume speed signals are used in conjunction with Form J train orders to protect traffic moving on a track where reduced speed is required. The investigation disclosed that train and engine service employees and maintenance of way supervisors had received verbal instructions from officials of the carrier that trains operating under Form U train orders were authorized to accept as a proper proceed signal, information conveyed by radio that the track was clear, provided that proper identification was made between the track force and the train involved. On receipt of a proceed signal given in this manner the train could then resume normal speed. Under these circumstances the restriction of the temporary slow signal to the prescribed 15 miles per hour did not apply after the proper signal was received and the train was authorized to proceed over the area designated in the Form U train order at normal speed, and additional hand, flag or lamp signals were not required. The practice of conveying proceed signals by radio to trains moving under Form U train orders had been in effect in this territory for a period of approximately two years prior to the occurrence of this accident, and has since been discontinued.

In the instant case as Extra 963 West approached Yampai radio communication was established between Gang No 3 and the engineer of this train. Witnesses on the two eastbound freight trains which had passed while the track force was on their lunch period and other employees on the locomotive and in the caboose of Extra 963 West, then heard information transmitted by radio-telephone that the track force, Gang No 3, was clear of the track. They also heard the engineer acknowledge this information as the proper proceed signal for Extra 963 West, required under provisions of train order No 600 and authorizing it to proceed at normal speed within the area designated in this order. It is evident, however, that the information conveyed for the movement of this train was issued erroneously by the track foreman and the maintenance-of-way on-track equipment involved was moved into positions obstructing the westward main track either immediately before or soon after Extra 963 West, as a result of this mistake, was authorized to proceed at normal speed into the area where the accident occurred.

Cause

This accident was caused by failure of a track foreman to keep maintenance-of-way on-track equipment clear of the track in a designated area over which a closely approaching train, after prior identification and communication with the track force involved, was authorized to proceed at speed.

Recommendation

It is recommended that the Atchison, Topeka and Santa Fe Railway Company take immediate steps to insure that trains entering any area designated under Form U train orders on track protected by temporary slow signals must reduce speed to the prescribed 15 miles per hour or less, before accepting a signal conveyed manually or by other means to proceed at a higher rate of speed.

Dated at Washington, D. C., this twentieth
day of August, 1964

By the Commission, Safety and Service Board No. 1

(SEAL)

HAROLD D. MCCOY,

Secretary

Appendix

Track Structure Involved

From the east on the westward main track there are, in succession, a tangent 451 feet in length, a 4°02' curve to the left 1,843 feet, and a tangent 772 feet to the point of accident and a considerable distance westward. In this vicinity, the grade for westbound trains is 1.37 percent descending.

Between 100 and 700 feet east of the point of accident, the main tracks are laid in a cut having walls about 15 feet in height. Because of the south wall of this cut and the curvature of the track, the view ahead from a westbound locomotive approaching the point of accident is restricted to a distance of about 1,300 feet.

On the day involved, a temporary slow signal for westbound trains was located 1.9 miles east of the point of accident. It consisted of an 18-inch disc with the word "SLOW" painted in black on a yellow background. A temporary resume-speed sign was located 815 feet east of the point of accident.

Mile posts 456 and 457 are located 1,225 feet east and 4,055 feet west of the point of accident, respectively.

Automatic signal 4541, governing westbound movements on the westward main track, is located 1.5 miles east of the point of accident.

Operating and Maintenance-of-Way Rules

10

COLOR SIGNALS

Color

Indication

* * *

Yellow

Proceed as prescribed by the rules

* * *

*10(A) Temporary slow signals, yellow flag, disc or light, will be displayed not less than one mile * * * in advance of locations where the speed of trains must be reduced, * * **

When temporary slow signals are displayed, trains must not exceed fifteen miles per hour, unless otherwise directed by train order or special instructions, until rear of train has passed temporary resume speed signal

* * *

Forms of Train Orders

* * *

U

Stop and Speed Limit Orders

* * *

- (2) Eight naught one 8 01 A M to five naught one 5 01 P M approach (gangs or machines) between 15 poles West of M P 10 and M P 11 between D and E prepared to stop until proper proceed signal received Speed limit (through gangs or passing machines) _____ M P H

To be used covering work where safety of the movement requires that trains approach prepared to stop, and are not to proceed through gangs or pass machines until authorized by proceed signal given with yellow flag or yellow light

MAINTENANCE-OF-WAY RULES

*770 Whenever necessary to do work on or about the track a sharp lookout must be kept at all times When the view is restricted or hearing impaired by any condition, foremen will assign one or more lookouts to insure the safety of the men * * **

*771 Before starting any work that may interfere with traffic, employees must secure "Line-Up" giving the location of all trains * * **

*1235 Line-Ups - * * **

** * * Before leaving the point at which "Line-Up" is obtained, the track car operator will read it aloud to all other occupants of the track car * * **

** * **

** * * Track car operators must not depend entirely on "Line-Ups" but must at all times keep a sharp lookout and take such other measures as will insure safety*

** * **

The maximum authorized speeds for westbound passenger and freight trains in the territory involved are, 79 and 60 miles per hour, respectively. However, on curves in the vicinity of the accident, westbound passenger and freight trains are restricted to 50 and 40 miles per hour, respectively.

Description of Maintenance-of-Way Equipment Damaged

The on-track tie-tamping machine was 16 feet 2 inches in length and weighed 15,000 pounds. It was powered by a diesel engine with drives to the transmission, hydraulic, and electrical systems. This machine was self-propelled and was capable of speeds up to 26 miles per hour in either direction. It was provided with hydraulic jacks and a portable set-off, and could be moved on or off the track structure by the operator and two trackmen. In addition to the running wheels, it was equipped with transverse wheels, which could be lowered for movement on the portable set-off rails.

The on-track combination power jack and tie-tamping machine was 11 feet 5 inches in length and weighed 8,700 pounds. It was powered by a 2-cylinder diesel engine with drives to the transmission, hydraulic, and electrical systems. This machine was self-propelled and was capable of a speed of 25 miles per hour in either direction. It was provided with eight vibrator tamping assemblies and two hydraulic rams having 20,000 pound capacity for track lifting. It was equipped with a portable set-off, and four power-operated transverse wheels for movement on the set-off rails.

Interstate Commerce Commission
Washington, D. C. 20423

Postage and Fees Paid
Interstate Commerce Commission

Official Business
Return After Five Days