

INTERSTATE COMMERCE COMMISSION
WASHINGTON

REPORT NO. 3468
THE DENVER AND RIO GRANDE WESTERN
RAILROAD COMPANY
IN RE ACCIDENT
AT PUEBLO, COLO., ON
MAY 30, 1952

SUMMARY

Date: May 30, 1952

Railroad: Denver and Rio Grande Western

Location: Pueblo, Colo.

Kind of accident: Rear-end collision

Trains involved: Freight : Freight

Train numbers: Second 46 : Extra 5574 East

Engine numbers: Diesel-electric units 5634, 5633, 5632 and 5631 : Diesel-electric units 5574, 5573, 5572 and 5571

Consists: 98 cars, caboose : 69 cars, caboose

Speeds: 6 m. p. h. : 40 m. p. h.

Operation: Timetable, train orders and automatic block-signal system; yard limits

Tracks: Double; 1°30' curve; 0.40 percent descending grade eastward

Weather: Clear

Time: 2:50 a. m.

Casualties: 2 killed; 3 injured

Cause: Failure properly to control speed of following train moving within yard limits

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3468

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION REPORTS
UNDER THE ACCIDENT REPORTS ACT OF MAY 6, 1910.

THE DENVER AND RIO GRANDE WESTERN RAILROAD COMPANY

July 25, 1952

Accident at Pueblo, Colo., on May 30, 1952, caused by
failure properly to control the speed of the
following train moving within yard limits.

REPORT OF THE COMMISSION¹

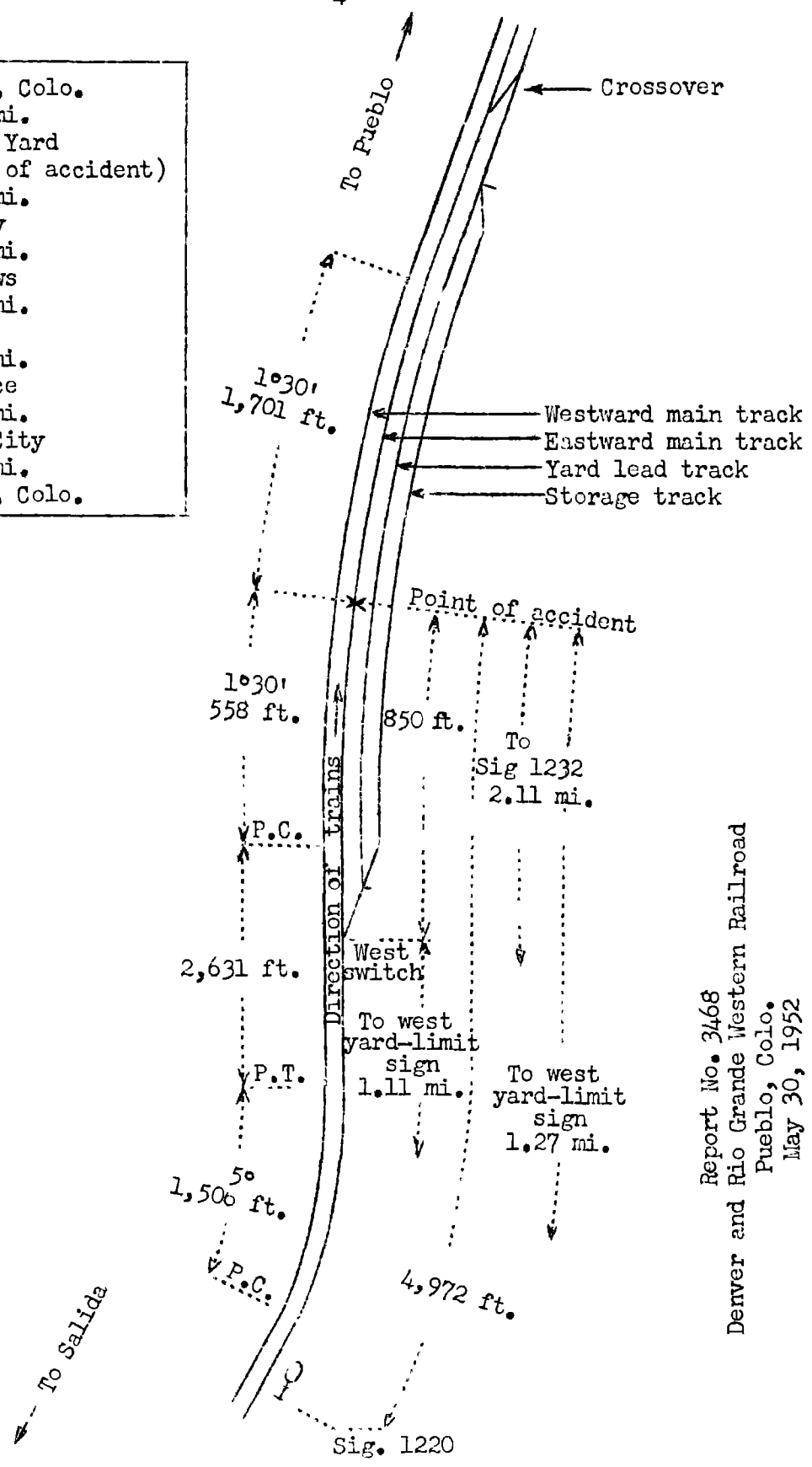
PATTERSON, Commissioner:

On May 30, 1952, there was a rear-end collision between two freight trains on the Denver and Rio Grande Western Railroad at Pueblo, Colo., which resulted in the death of two employees, and the injury of three employees. This accident was investigated in conjunction with a representative of the Public Utilities Commission of Colorado.

¹

Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.

- o Pueblo, Colo.
- | 0.7 mi.
- X Pueblo Yard
- | (Point of accident)
- | 8.9 mi.
- o Livesey
- | 5.6 mi.
- o Swallows
- | 5.0 mi.
- o Hobson
- | 12.3 mi.
- o Florence
- | 8.1 mi.
- o Canon City
- | 55.1 mi.
- o Salida, Colo.



Report No. 3468
 Denver and Rio Grande Western Railroad
 Pueblo, Colo.
 May 30, 1952

Location of Accident and Method of Operation

This accident occurred on that part of the Pueblo Division extending between Salida and Pueblo, Colo., 95.7 miles. In the vicinity of the point of accident this is a double-track line, over which trains are operated by timetable, train orders and an automatic block-signal system. At Pueblo Yard, 95 miles east of Salida, two auxiliary tracks parallel the eastward main track on the south. These tracks from north to south are designated as the yard lead-track and the storage track. The west switch of the yard lead-track is located in the eastward main track 1.11 miles east of the west yard-limit sign. The accident occurred on the eastward main track within yard limits at Pueblo Yard, 1.27 miles east of the west yard-limit sign and 850 feet east of the switch at the west end of the yard lead-track. From the west there are, in succession, a 5° curve to the left 1,506 feet in length, a tangent 2,631 feet and a 1°30' curve to the right 558 feet to the point of accident and 1,701 feet eastward. The grade for east-bound trains varies between 0.51 percent descending and level throughout a distance of 2.35 miles immediately west of the point of accident. At the point of accident the grade is 0.40 percent descending eastward.

Automatic signals 1232 and 1220, governing east-bound movements on the eastward main track, are located, respectively, 2.11 miles and 4,972 feet west of the point of accident. These signals are of the color-light type. Signal 1232 is approach lighted and signal 1220 is continuously lighted. Each signal displays three aspects. The aspects applicable to this investigation and their corresponding indications and names are as follows:

<u>Signal</u>	<u>Aspect</u>	<u>Indication</u>	<u>Name</u>
1232	Yellow light over marker plate	Proceed preparing to stop at next signal. Train exceeding medium speed must at once reduce to that speed.	APPROACH
1220	Red light over marker plate	Stop then proceed. (See Rule 509.)	STOP AND PROCEED

The controlling circuits are so arranged that when the block of signal 1220 is occupied, signal 1232 indicates Approach and signal 1220 indicates Stop and Proceed.

This carrier's operating rules read in part as follows:

DEFINITIONS

MEDIUM SPEED. A speed not exceeding one-half authorized speed, but not exceeding 30 miles per hour.

RESTRICTED SPEED. A speed that will permit stopping short of another train or an obstruction, but not exceeding 15 miles per hour.

34. All members of train and engine crews must, when practicable, communicate to each other by its name, the indication of all signals affecting the movement of their train or engine, except fixed signals which display a permanent indication.

93. Yard limits will be indicated by yard limit signs. Within yard limits, the main track may be used clearing first class trains as prescribed by the rules.

Second and inferior class trains, extra trains and engines must move on all tracks within yard limits prepared to stop unless the track is seen or known to be clear.

509. When a train or engine is stopped by a Stop and Proceed ABS, it may proceed at once at restricted speed to the next ABS, expecting to find a train in the block, broken rail, slide warning device plug pulled out, obstruction or switch not properly lined. * * *

Bulletin No. 1 - Reissue, under date of January 1, 1952, reads in part as follows:

Fireman (Helpers) on diesel electric locomotives in road freight service will be governed by the following:

1. The diesel helper is under the jurisdiction of and must obey instructions of the engineer * * *
2. The helper will patrol the engine room as frequently as conditions in the engine room require.
3. The helper is responsible for operating conditions, observation of signals, etc., only when he is in the cab and also when directed by the engineer to note some particular situation.

The maximum authorized speed for freight trains is 45 miles per hour.

Description of Accident

Second 46, an east-bound second-class freight train, consisted of Diesel-electric units 5634, 5633, 5632 and 5631, coupled in multiple-unit control, 98 cars and a caboose. This train passed Florence, the last open office, 31.8 miles west of Pueblo Yard, at 1:51 a. m., 7 hours 22 minutes late. At Pueblo Yard it was diverted from the eastward main track through a crossover to a yard track, and while moving at an estimated speed of 6 miles per hour and when the caboose was at a point on the eastward main track about 1.27 miles east of the west yard-limit sign the rear end was struck by Extra 5574 East.

Extra 5574 East, an east-bound freight train, consisted of Diesel-electric units 5574, 5573, 5572 and 5571, coupled in multiple-unit control, 69 cars and a caboose. This train passed Florence, the last open office, at 2:03 a. m., passed signal 1232, which indicated Approach, passed the west yard-limit sign at Pueblo Yard, passed signal 1220, which indicated Stop and Proceed, and while moving at a speed of 40 miles per hour it struck the rear end of Second 46.

The caboose and the rear four cars of Second 46 were derailed. The caboose was badly damaged and the rear four cars were destroyed. Extra 5574 East stopped with the front end of the first Diesel-electric unit about 337 feet east of the point of collision. The Diesel-electric units were derailed. The first unit overturned and stopped on its right side, with the front end on the north rail of the storage track and the rear end diagonally across the yard lead-track. The rear three units stopped upright. The front end of the second Diesel-electric unit stopped near the rear end of the first unit. The second unit was diagonally across

the yard lead-track and the eastward main track, with the rear end on the westward main track. The front end of the third unit was against the rear end of the second unit and this unit was diagonally across the eastward main track and the yard lead-track. The front end of the fourth unit was against the rear end of the third unit. The fourth unit was diagonally across the yard lead-track and the eastward main track, with the rear end on the westward main track. The first unit was badly damaged and the rear three units were considerably damaged. The first 17 cars were derailed and stopped in various positions across the two main tracks and the auxiliary tracks. The first three cars and the fourteenth to the sixteenth cars, inclusive, were badly damaged. The fourth to the thirteenth cars, inclusive, and the seventeenth car were destroyed. Eight cars of a cut of cars which were standing on the storage track were struck by derailed equipment. They were badly damaged.

The conductor and the flagman of Second 46 were killed. The engineer, the fireman and the front brakeman of Extra 5574 East were injured.

The weather was clear at the time of the accident, which occurred about 2:50 a. m.

The Diesel-electric units of Extra 5574 East were provided with 24-RL and dynamic brake equipment. The first Diesel-electric unit of Extra 5574 East was equipped with a safety-control feature. If pressure on the pedal of this device is released, power to the traction motors of the Diesel-electric units will be cut off and a service application of the brakes will result, unless a brake application of predetermined brake-cylinder pressure has been made.

The caboose of Second 46 and the locomotive and the caboose of Extra 5574 East were provided with radio train communication system equipment.

Discussion

At Pueblo Yard Second 46 was diverted from the eastward main track through a crossover to a yard track. As this train was entering the yard track the speed was about 6 miles per hour. The engineer, the fireman and the front brakeman were maintaining a lookout ahead from the control compartment at the front of the locomotive. The conductor and the flagman were in the caboose. The members of the

crew on the locomotive said that they had observed at various points en route that the markers at the rear of the caboose were lighted. Before the train had cleared the eastward main track and when the caboose had reached a point about 4,972 feet east of signal 1220 the rear end was struck by the following train. None of the members of the crew on the locomotive was aware of anything being wrong until the brakes became applied in emergency at the time the collision occurred.

As Extra 5574 East was approaching the point where the accident occurred the speed was about 43 miles per hour, as indicated by the tape of the speed recording device. The engineer was seated at the control station on the right side of the control compartment and the front brakeman was occupying the fireman's seat on the left side of the control compartment at the front of the first Diesel-electric unit. The fireman was in the control compartment at the rear of the fourth Diesel-electric unit. The conductor and the flagman were in the cupola of the caboose. The headlight was lighted. The brakes of this train had been tested and had functioned properly when used en route. No stop was made by this train between Salida and the point of accident. The engineer said that the last signal which he observed was signal 1272, located 7.2 miles west of the point of accident, which indicated Proceed. He said he lost consciousness before the locomotive passed the signal and he remembered nothing more until after the accident had occurred. He said that he and the front brakeman had called the indications of preceding signals and there had been a conversation between them after the train passed Livesey, 8.9 miles west of the point of accident. The windows of the control compartment had been closed after the train passed Florence, 31.8 miles west of the point of accident, and were not again opened before the accident occurred. The engineer said he thought that at the time he became unconscious the throttle was in off position and the dynamic brake was applied lightly. He said that before losing consciousness he had not felt ill and had not observed the presence of any exhaust fumes or odors in the control compartment. The front brakeman said that he remembered observing the aspect and calling the indication of the first or second signal east of the end of double-track at Swallows, 14.5 miles west of the point of accident. He said that he had no recollection of events from that time until after the accident. The fireman said that he left the control compartment at the front of the locomotive to inspect the operation of the equipment when

the train was in the vicinity of Canon City, 59.9 miles west of the point of accident, and did not return before the accident occurred. He said that he made an inspection trip to the front end of the engine compartment of the first Diesel-electric unit when the train was approaching Livesey and he observed that the dynamic brake was applied at that time. He did not observe any defective condition and returned to the control compartment at the rear end of the fourth Diesel-electric unit. He said that the pneumatic horn was not sounded for a highway crossing in the vicinity of the west yard-limit sign at Pueblo Yard, but the train was being operated in a normal manner, and it did not occur to him to communicate with the engineer on the train communication system to ascertain the reason the horn was not sounded. The conductor said that the operation of the train seemed normal and he thought the speed at the west yard-limit sign was about 25 miles per hour. He said that he felt a slight run-in of slack as the train approached Pueblo Yard and he assumed that the engineer was controlling the speed by use of the dynamic brake. He said that the air brakes were not applied before the collision occurred. The flagman said that he last communicated on the train communication system with a member of the crew in the control compartment of the locomotive when the train was in the vicinity of Hobson, 19.5 miles west of the point of accident. He said that he was on the right side of the cupola when the accident occurred, and because of the darkness he was unaware that the train was entering the yard at excessive speed. An employee of a dairy located in the vicinity of the point of accident witnessed the collision. He said that he heard the pneumatic horn of the locomotive sounded as the train was approaching and then observed that sparks were flying from the wheels of the locomotive. He thought that the brakes were applied before the collision occurred.

Examination of the first Diesel-electric unit of Extra 5574 East after the accident occurred disclosed that the automatic brake valve was in emergency position. The reversing lever was in position for forward movement, the throttle was in No. 1 position and the transition lever was in No. 2 position, and this would indicate that power was being used. Examination of the tape of the speed-recording device indicated that the brakes functioned to control the speed of the train at various points west of Pueblo Yard. Throughout a distance of 5 miles immediately west of the point of accident the speed varied between 40 and 45 miles

per hour. At a point 1.1 miles west of the point of accident the speed was 44 miles per hour. The speed then was reduced to 40 miles per hour at the point of accident and the deceleration indicates that emergency brake action did not become effective before the collision occurred. The brakes of the undamaged cars were tested and they functioned properly.

Inspection of the signal apparatus after the accident occurred disclosed no defective condition. When tested the signal system functioned as intended.

Five days after the accident occurred a test train was operated eastward between Canon City and Pueblo Yard. This train was operated in such manner as to duplicate, in so far as possible, the indicated speed at which Extra 5574 East was operated from the point where the engineer of that train said that he became unconscious to the point where the accident occurred. The test train consisted of a 4-unit Diesel-electric locomotive, 58 loaded cars, 11 empty cars and a caboose, 3,726 tons. On the day of the accident, Extra 5574 East consisted of a similar type 4-unit Diesel-electric locomotive, 57 loaded cars, 12 empty cars and a caboose, 3,758 tons. At the point where the engineer of Extra 5574 East said that he had lost consciousness and that the throttle of his locomotive was in off position and the dynamic brake applied lightly, the indicated speed of Extra 5574 East was 36 miles per hour and the test train was operated at a speed of 35 miles per hour. However, at that point the transition lever of the locomotive of the test train was in No. 2 position and the throttle was in run-3 position. When the test train was in the vicinity of signal 1272 it was necessary to move the throttle to run-5 position and place the transition lever in No. 3 position in order to maintain a speed as near as possible to that of Extra 5574 East at the same point. At a point 5.2 miles west of the point of accident the throttle of the locomotive of the test train was reduced to run-1 position and after the train proceeded eastward a distance of 1 mile the throttle was placed in run-2 position. When the test train was 3 miles west of the point of accident the throttle was moved to run-4 position for a distance of 0.8 mile and it was then reduced to run-1 position and the transition lever was moved to No. 2 position. No further adjustments of the controls of the locomotive of the test train were made until the brakes were applied at the point where the accident occurred. Comparison of the tapes of the speed-recording devices of the locomotives of the test train and Extra 5574 East disclosed that throughout a distance of 8 miles immediately

west of the point of accident the speed at which the test train was operated varied between a minimum of 35 miles per hour and a maximum of 43 miles per hour, with a maximum variation at any point of 1.5 miles per hour from the indicated speed of Extra 5574 East over the same territory on the day of the accident. At the point of accident the speed of the test train was 59 miles per hour and the indicated speed of Extra 5574 East was 40 miles per hour. It is apparent that in the operation of a train of about the same consist as Extra 5574 East on the day of the accident the use of power is required to maintain the speed within the indicated range of that of both the test train and Extra 5574 East in approach to the point of accident, and manipulation of the controls of the locomotive is required to so control the speed.

This accident occurred within yard limits. Under the rules of this carrier governing the operation of trains within yard limits, Extra 5574 East was required to be operated in such manner that it could be stopped short of a preceding train. The indication of the last signal which this train passed placed a similar restriction on its movement.

Cause

It is found that this accident was caused by failure properly to control the speed of the following train moving within yard limits.

Dated at Washington, D. C., this twenty-fifth day of July, 1952.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,

Secretary.