

INTERSTATE COMMERCE COMMISSION
WASHINGTON

INVESTIGATION NO. 3036
CHICAGO GREAT WESTERN RAILWAY COMPANY
REPORT IN RE ACCIDENT
NEAR CORNELIA, IOWA, ON
NOVEMBER 9, 1946

SUMMARY

Railroad: Chicago Great Western

Date: November 9, 1946

Location: Cornelia, Iowa

Kind of accident: Derailment

Train involved: Passenger

Train number: 31

Engine number: 917

Consist: 5 cars

Estimated speed: 40 m. p. h.

Operation: Timetable, train orders and
manual-block system

Track: Single; 1° curve; 0.67 percent
descending grade westward

Weather: Rain and snow

Time: 2:55 p. m.

Casualties: 1 killed; 3 injured

Cause: Irregularity in surface and aline-
ment of track, combined with
improper adjustment of side-bearing
clearance and slack between engine
and tender

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 3036

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

CHICAGO GREAT WESTERN RAILWAY COMPANY

December 18, 1946

Accident near Cornelia, Iowa, on November 9, 1946, caused by irregularity in the surface and alinement of the track, combined with improper adjustment of side-bearing clearance and slack between the engine and the tender.

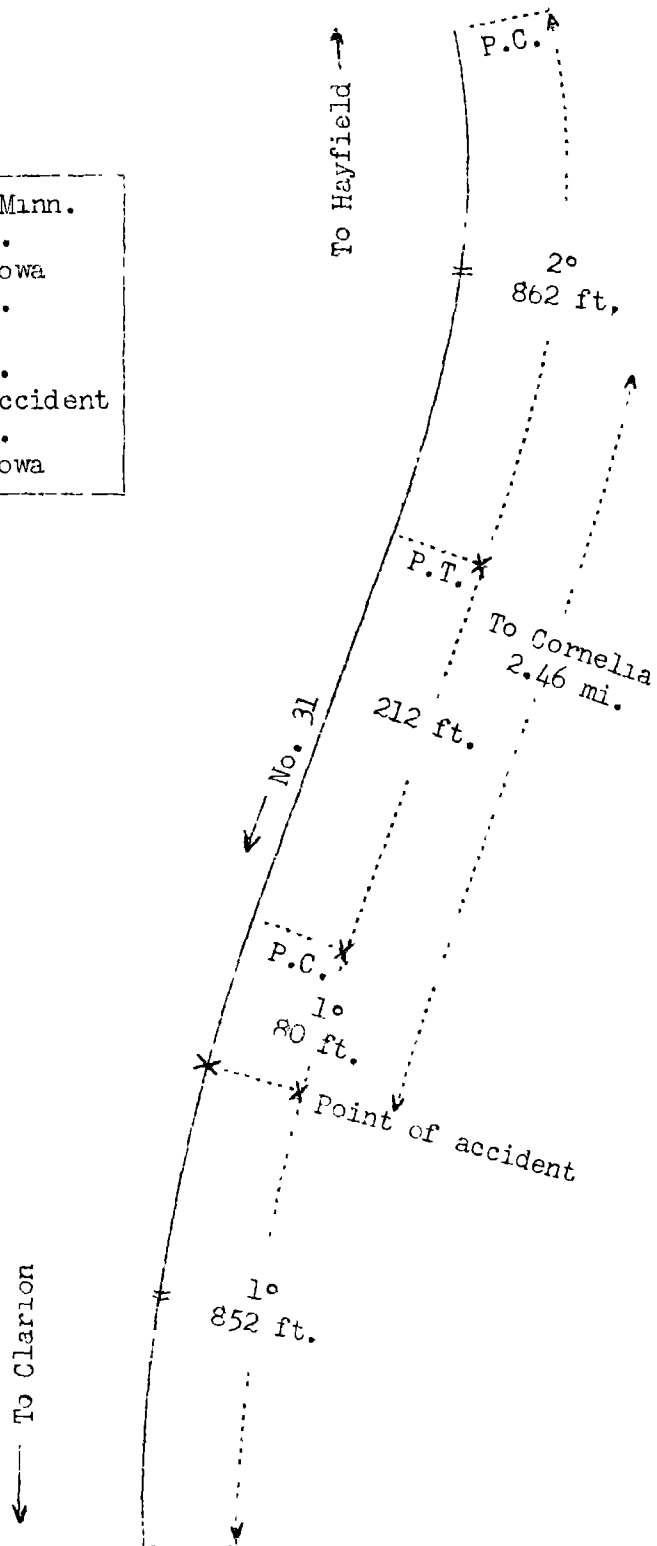
REPORT OF THE COMMISSION¹

PATTERSON, Commissioner:

On November 9, 1946, there was a derailment of a passenger train on the Chicago Great Western Railway near Cornelia, Iowa, which resulted in the death of one maintenance-of-way employee, and the injury of two train-service employees.

¹Under 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	Hayfield, Minn.
	90.40 mi.
o	Belmond, Iowa
	5.50 mi.
o	Cornelia
	2.46 mi.
X	Point of accident
	2.64 mi.
o	Clarion, Iowa



Inv. No. 3036
Chicago Great Western Railway
Cornelia, Iowa
November 9, 1946

Location of Accident and Method of Operation

This accident occurred on that part of the Minnesota Division extending between Hayfield, Minn., and Clarion, Iowa, 101 miles, a single-track line, over which trains are operated by timetable, train orders and a manual-block system. The accident occurred on the main track 98.36 miles west of Hayfield and 2.43 miles west of the station at Cornelia. From the east there are, in succession, a 2° curve to the right 362 feet in length, a tangent 212 feet and a 1° curve to the left 80 feet to the point of accident and 352 feet westward. The grade for west-bound trains varies between 0.07 percent and 0.78 percent descending throughout a distance of about 1 mile to the point of accident, where it is 0.67 percent descending.

On the curve on which the derailment occurred the track is laid on a 10-foot fill. The track structure consists of 77.5-pound rerolled rail, 33 feet in length, laid in 1922, on an average of 20 ties to the rail length. It is tieplated at scattered locations, single-spiked, provided with 4-hole angle bars, and is ballasted with a mixture of cinders and gravel to a depth of 12 inches. At the point of derailment the super-elevation was 2-1/16 inches, and the gage was 4 feet 8-3/4 inches.

The maximum authorized speed for passenger trains is 50 miles per hour.

Description of Accident

No. 31, a west-bound first-class passenger train, consisted of engine 917, a 4-6-2 type, two box cars, one baggage-mail car, one passenger-baggage car and one cafe-coach, in the order named. All cars were of steel construction. This train departed from Belmond, the last open office, 5.5 miles east of Cornelia, at 2:44 p. m., 18 minutes late, and while moving at an estimated speed of 40 miles per hour the No. 1 pair of wheels of the front tender-truck were derailed to the right at a point 80 feet west of the east end of a 1° curve to the left. These wheels continued in line with the track 986 feet westward to the point where the derailment of all the wheels of the engine, the tender the first three cars and the front truck of the fourth car occurred.

The engine overturned to the right and stopped upside down at the foot of the fill and practically in line with the track, with the front end 240 feet west of the point where the general derailment occurred and 8 feet north of the track. The cab was demolished, and steam pipes within the cab were broken. The tender stopped on its right side, off its trucks, at the rear of the engine and about 13 feet north of the track and in line with it. The trucks stopped in the vicinity of the rear of the tender. Breaks in the safety chains of the tender-truck

assemblies were new, which indicated that these breaks occurred as a result of the derailment. The first car stopped upside down, at the rear of the tender and at an angle of 45 degrees to the track. The second car stopped upright, with its front end on the first car and the rear end on the roadbed and at an angle of 45 degrees to the track. The third car stopped practically upright on the roadbed and in line with it. The derailed cars were somewhat damaged.

Rain and snow were falling at the time of the accident, which occurred about 2:55 p. m.

The engineer and the fireman were injured.

The tender of engine 917 is rectangular in shape. Its capacity is 14 tons of coal and 8,000 gallons of water. It was estimated that the tender contained 12 tons of coal and 7,500 gallons of water at the time the derailment occurred, and that the center of gravity of the tender was 70 inches above the tops of the rails. The tender is provided with two 4-wheel trucks, having 6-inch by 11-inch journals and 33-inch wheels. The spring arrangements consist of a set of three elliptical springs on each side of each truck. Side-bearings are provided on each truck. The specified clearance of the front side-bearings is 7/8-inch and for the rear side-bearings it is 3/8-inch. The trucks are spaced 13 feet 4 inches between centerpins, the wheel-base of each truck is 5 feet 6 inches, and the total length is 23 feet 5-7/8 inches. Chafing plates are provided at the rear of the engine and the front of the tender. The chafing plate on the engine is attached rigidly to the tailpiece of the frame. The chafing plate on the tender is contained in a pocket casting compressed by a helical spring. The chafing plates are lubricated by an alerite system. The last monthly inspection and repairs of engine 917 were completed on October 21, 1946, and the last trip inspection and repairs were completed at 6:20 p. m., November 8, 1946, at Hayfield, Minn.

Discussion

No. 31 was moving on a 1° curve to the left at an estimated speed of 40 miles per hour, in territory where the maximum authorized speed was 50 miles per hour, when the front wheels of the front tender-truck were derailed to the right at a point 80 feet west of the east end of the curve, where the superelevation was 2-1/16 inches and the gage was 4 feet 8-3/4 inches. These wheels continued in line with the track 986 feet to the point where the general derailment occurred. There was no indication of dragging equipment, or of any obstruction having been on the track.

As No. 31 was approaching the point where the accident occurred the speed was about 50 miles per hour. A section foreman,

who was on the left side of the cab, and the engineer were maintaining a lookout ahead. The fireman was on the deck of the engine tending the fire. When the train entered upon the descending grade about 1 mile east of the point where the derailment occurred the engineer placed the throttle lever in drifting position. He said that this action was taken to reduce the speed to about 40 miles per hour, which he thought was the maximum safe speed in this territory as the engine had a tendency to roll and to lift considerably. The first the enginemen knew of anything being wrong was when they observed that the tender was derailed. Then the engineer moved the brake valve to emergency position, but the general derailment occurred before the train could be stopped. The section foreman was fatally injured when the engine overturned.

Examination of the track throughout a considerable distance immediately east of the point of derailment disclosed that at many places where tieplates were not provided the ties were considerably rail-cut, and a number of the ties were badly decayed. Measurements of the track throughout the 212-foot tangent immediately east of the curve involved disclosed variations in the cross levels of from 1/4-inch to 5/8-inch between the north rail and the south rail. The deflection under load was about 1/4-inch, which further aggravated the irregularity in surface. There was considerable irregularity in the alinement of the track as a result of variation in the gage, which ranged from 4 feet 2-5/8 inches to 4 feet 9-1/4 inches. The first mark of derailment was a flange mark on top of the high rail of the 1° curve to the left about 3/8-inch from the gage side at a point 80 feet west of the east end of the curve. This mark continued diagonally outward across the top of the head of the rail a distance of 12.5 feet. At a point 2.3 feet westward a wheel mark appeared on the ties inside the low rail, and from this point westward to the point where the general derailment occurred wheel marks appeared on the track structure outside the high rail and inside the low rail. The marks on the track structure and marks on the front truck of the tender indicate that the No. 1 pair of wheels of the front truck were the first to become derailed.

The track in this vicinity was last lined and surfaced about 10 days prior to the day of the accident. Members of the section force had passed over the track on a motor-car about 3 hours prior to the accident. These employees thought the condition of the track was safe for normal service.

Examination of the tender of engine 917 after the accident disclosed that the left side-bearing of the front truck had proper clearance, but the right side-bearing bore evidence that considerable friction had existed between the bearing surfaces for some time. The right top-bearing was worn 1/4-inch at its outer edge and 1/8-inch at its inner edge. The left top-bearing

was worn 1/16-inch. Both bottom-bearings were worn 3/8-inch at the outer edges. When the derailment occurred the tender was practically fully loaded and as it was moving on the curve to the left the greater portion of the spring-borne weight was borne on the right side. The enginemen said that the engine and tender had a tendency to roll and to lift, and that there was considerable slack action between the coupling plates when the train was drifting. These conditions together with the irregularity in surface and alinement of the track evidently permitted the right No. 1 wheel of the front truck of the tender to rise high enough for the flange to mount the rail, and then the flange continued on top of the rail to the point where it dropped outside the rail.

Cause

It is found that this accident was caused by irregularity in the surface and alinement of the track, combined with improper adjustment of side-bearing clearance and slack between the engine and the tender.

Dated at Washington, D. C., this eighteenth day of December, 1943

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,
Secretary.