INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT NO. 3502

CHICAGO AND NORTH WESTERN RAILWAY COMPANY

IN RE ACCIDENT

AT COUNCIL BLUFFS, IOWA, ON

JANUARY 7, 1953

SUMMARY

Date:	January 7, 1953
Railroad:	Chicago and North Western
Location:	Council Bluffs, Iowa
Kind of accident:	Derailment
Train involved:	Passenger
Train number:	27
Engine number:	Diesel-electric units 5011A and 5014B
Consist:	13 cars
Estimated speed:	45 m. p. h.
Operation:	Timetable, train orders and automatic train-control system
Tracks:	Double; tangent; 0.04 percent ascending grade westward
Weather:	Cloudy
Time:	1:10 a. m.
Casualties:	1 injured
Cause:	Broken journal

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3502

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

CHICAGO AND NORTH WESTERN RAILWAY COMPANY

March 20, 1953

Accident at Council Bluffs, Iowa, on January 7, 1953, caused by a broken journal.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On January 7, 1953, there was a derailment of a passenger train on the Chicago and North Western Railway at Council Bluffs, Iowa, which resulted in the injury of one dining-car employee.

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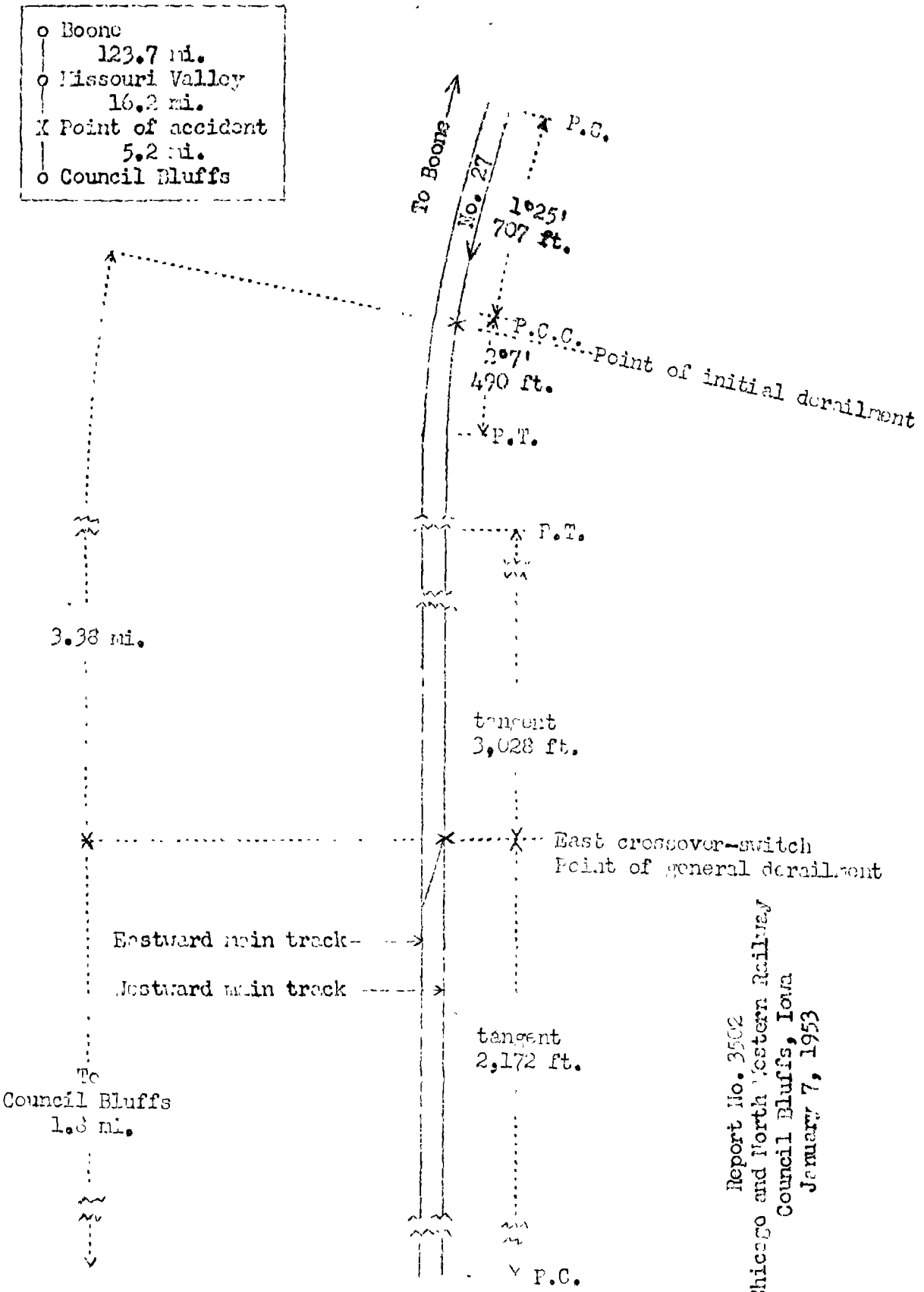
[1] Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.



Report No. 3502
Chicago and North Western Railway
Council Bluffs, Iowa
January 7, 1953

Location of Accident and Method of Operation

This accident occurred on that part of the Iowa Division extending between Boone and Council Bluffs, Iowa, 145.1 miles, a double-track line, over which trains moving with the current of traffic are operated by timetable, train orders and an automatic train-control system. The current of traffic is to the left. Within yard limits at Council Bluffs a facing-point crossover connects the westward and eastward main tracks. The east switch of this crossover is located in the westward main track at a point 1.8 miles east of the station at Council Bluffs. The initial derailment occurred on the westward main track at a point 3.38 miles east of this crossover and the general derailment occurred at the frog of the turnout of the east crossover switch. The initial derailment occurred on a 2°7' curve to the left, then there are, in succession, a series of curves and tangents throughout a distance of 2.8 miles and a tangent 3,028 feet to the point of general derailment and 2,172 feet westward. The grade for west-bound trains on the westward main track between the initial point of derailment and the point of general derailment varies between 0.42 percent descending and 0.15 percent ascending and at the point of general derailment it is 0.04 percent ascending.

In the vicinity of the point of accident the track structure of the westward main track consists of 112-pound rail, 39 feet in length, laid new in 1946 on an average of 24 treated hardwood ties per rail length. It is fully tie-plated with double-shoulder tieplates, single-spiked on tangent track and double-spiked on curves, and is provided with 4-hole 24-inch joint bars and an average of 8 rail anchors per rail. It is ballasted with gravel to a depth of 13 inches.

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

705. * * *

* * * Operators and employes of the Maintenance Department are required to observe trains closely and if any dangerous condition is noted * * * the attention of trainmen or enginemen must be called to the fact by signal. Trainmen and enginemen must be on the lookout for signals from the above employes or from others.

* * *

Passenger Trainmen.

939. They must watch their train very carefully to discover defective journals * * *; keep a sharp lookout for all signals from trains and from stations. * * *

Enginemen and Firemen.

1042. They must keep a vigilant lookout at all times, particularly when passing around curves or through stations and yards, and must frequently look back to watch for any signals that may be given by trainmen or others * * *

The maximum authorized speed for the passenger train involved in this accident was 60 miles per hour in the vicinity of the point where the initial derailment occurred and 40 miles per hour in the vicinity of the point where the general derailment occurred.

Description of Accident

No. 27, a west-bound first-class passenger train, consisted of Diesel-electric units 5011A and 5014B, coupled in multiple-unit control, two coaches, one dormitory car, three coaches, one lounge car, one dining car, one lounge car and four sleeping cars, in the order named. All cars were of steel construction. The fifth to the thirteenth cars, inclusive, were equipped with tightlock couplers. This train departed from Boone at 11:09 p. m., 1 hour 4 minutes late, passed Missouri Valley, 16.2 miles east of the point of accident and the last open office, at 12:50 a. m., 28 minutes late, and while it was moving at an estimated speed of 60 miles per hour the left front wheel of the front truck of the fourth car was derailed at a point 139.9 miles west of Boone and 5.38 miles east of the east crossover switch at Council Bluffs. The speed of the train was reduced in the vicinity of the east yard-limit sign at Council Bluffs and while it was moving at an estimated speed of 45 miles per hour, the rear truck of the third car, the other wheels of the fourth car, and the fifth to the thirteenth cars, inclusive, were derailed at the frog of the turnout of the east crossover switch.

Separations occurred between the third and fourth cars, between the seventh and eighth cars and between the eighth and ninth cars. The locomotive and the first three cars stopped with the front end about 2,050 feet west of the point of general derailment and the rear end of the third car about 560 feet west of the front end of the fourth car. None of the derailed cars overturned. The fourth to the eighth cars, inclusive, stopped in diagonal positions on or near the westward main track and an auxiliary track adjacent to the westward main track. The ninth to the eleventh cars, inclusive, and the front end of the twelfth car were derailed to the south. The ninth car stopped parallel to and about 30 feet south of the westward main track. The tenth and eleventh cars and the front end of the twelfth car stopped about in line with the ninth car. The rear end of the twelfth car and the thirteenth car stopped on the track structure, with the rear end of the rear car about 275 feet west of the point of general derailment. The trucks and the appurtenances below the floor level of the derailed cars were damaged. The fourth, fifth, eighth and ninth cars were badly damaged and the sixth and seventh cars were somewhat damaged. The other derailed cars were slightly damaged.

The weather was cloudy at the time of the accident, which occurred about 1:10 a. m.

The fourth car, S.P. 2326, a conventional all-steel coach, was built in November, 1927. It is 81 feet long between the pulling faces of the couplers, and its light weight is 160,900 pounds. It is provided with two 6-wheel trucks, spaced 56 feet 1/8-inch between truck centers. The trucks are equipped with 5-inch by 9-inch journals and multiple-wear steel wheels.

Discussion

No. 27 was moving at a speed of about 45 miles per hour when the derailment occurred. The engineer and the fireman were maintaining a lookout ahead from the control compartment at the front of the locomotive. The members of the train crew were in various locations in the cars of the train. Prior to the time of the accident the locomotive and the cars had been riding smoothly. As the train was approaching Council Bluffs the enginemen observed that a lighted fusee was displayed in the vicinity of a locomotive on an adjacent yard track and a few seconds later the brakes became applied in emergency as a result of the derailment.

Examination of the track structure after the accident occurred disclosed no condition which could have caused or contributed to the cause of the accident. Flange marks on the ties and marks on the bolts of joint bars indicated that a wheel had become derailed inside the south rail at a point 3.38 miles east of the facing-point crossover at the east end of the yard at Council Bluffs. This wheel continued in line with the track and struck the planking of a road crossing and of a track motor-car set-off located, respectively, 1.37 miles and 3.08 miles west of the initial point of derailment. The derailed wheel struck the switch point of the east switch of the facing-point crossover and the general derailment occurred at the frog of the turnout of this switch.

Examination of the equipment after the accident occurred disclosed that the right front journal of the front truck of S.P. 2326, the fourth car, had broken and the stub of the journal had been in contact with the back end of the journal box. Apparently the resultant wear on the journal box and the concentration of weight on the companion journal had caused the left wheel to act as a fulcrum and the right wheel to be raised above the rail. As a result, the left front wheel dropped inside the south rail. When the failed journal was examined immediately after the accident occurred the detached portion was cool, but the stub of the journal was hot. Some burned packing was found in the journal box. A small quantity of packing which was not burned and fragments of the journal brass were found in the bottom of the journal box.

The failure of the journal involved was caused by an irregular break at a point 6-3/4 inches inward from the collar. Thermal cracks and copper penetration at various points of the bearing surface of the journal, apparently caused by overheating at some previous time, were found in the immediate vicinity of the point of fracture. The axle involved was provided with 5-inch by 9-inch journals. The diameter of the journal adjacent to the collar was 4-13/16 inches, and at the point of failure it was 4-3/4 inches. The end of the journal remaining attached to the wheel assembly was worn smooth by contact with the journal box. The axle bore the marking "A-4-14-1933" between the wheel seats. The end of the companion journal bore the marking "M. LA 7-3-51." This indicates that the journals received a magnetic particle

test on July 3, 1951. The date on which the journal box of the failed journal was last repacked could not be determined because the marking was illegible and there was no other available record. There were no available records to indicate when the wheels and the axle involved were applied to the car.

A chemical analysis of the failed portion of the journal disclosed that the manganese content of the steel was 0.54 percent, slightly below the minimum requirement for this element as specified by the Association of American Railroads. The laboratory analysis disclosed that thermal cracks had developed and copper penetration of the journal had occurred as a result of overheating prior to that which immediately preceded the failure of the journal. The journal was weakened by the copper penetration of the bearing surface. The journal failed as a result of a progressive fracture which originated from previously developed thermal cracks. The overheating which immediately preceded the failure of the journal was secondary.

The equipment of No. 27 was last inspected by members of the mechanical force of the carrier before the train departed from Boone at 11:09 p. m., about 2 hours 1 minute before the accident occurred, and no exceptions were taken. The journal box of the journal involved was inspected at this time and no defective condition was found. The members of the crew of No. 27 said that they made frequent observations of the equipment throughout the trip, and they observed no defective condition. However, because of snow blowing around the running gear of the cars visibiltiy was restricted. The flagman said that he received proceed signals from the operators at two open offices and from employees at rail-highway grade crossings and other points adjacent to the track at five other locations between Boone and the point where the accident occurred. No. 27 was not stopped between Boone and the point of accident. An employee in the baggage room of the station at Missouri Valley observed a blazing journal box when No. 27 passed but he was unable to give stop signals to members of the crew. He then informed the operator, who immediately informed the train dispatcher of the condition that had been observed. Because there was no intervening open office the dispatcher arranged to have stop signals displayed at Council Bluffs, and members of a yard crew were instructed to display stop signals for No. 27 at the east end of the yard. The enginemen of No. 27 said that when they first observed a lighted fusee displayed in the vicinity of a yard locomotive on an auxiliary track not immediately adjacent to the westward main track, they thought that it was intended to govern a switching movement. A few seconds later the brakes of their train became applied in emergency as a result of the derailment.

Cause

It is found that this accident was caused by a broken journal.

Dated at Washington, D. C., this twentieth day of March, 1953.

By the Commission, Commissioner Patterson.

(SEAL)

GEORGE W. LAIRD,

Acting Secretary.