INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT NO. 3699

THE ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

IN RE ACCIDENT

AT CARROLLTON, MO., ON

JULY 22, 1956

SUMMARY

Date:	July 22, 1956
Railroad:	Atchison, Topeka and Santa Fe
Location:	Carrollton, Mo.
Kind of accident:	Derailment
Train involved:	Passenger
Train number:	1
Locomotive number:	Diesel-electric units 46C, 46B, 46A, and 46
Consist:	13 cars
Speed:	85 m. p. h.
Operation:	Signal indications
Tracks:	Double; tangent; level
Weather:	Clear
Time:	10:12 p. m.
Casualties:	22 injured
Cause:	Obstruction on track

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3699

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

THE ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

September 7, 1956

Accident at Carrollton, Mo., on July 22, 1956, caused by an obstruction on the track.

REPORT OF THE COMMISSION[1]

CLARKE, Commissioner:

On July 22, 1956, there was a derailment of a passenger train on the Atchison, Topeka and Santa Fe Railway at Carrollton, Mo., which resulted in the injury of 21 passengers and 1 train baggageman.

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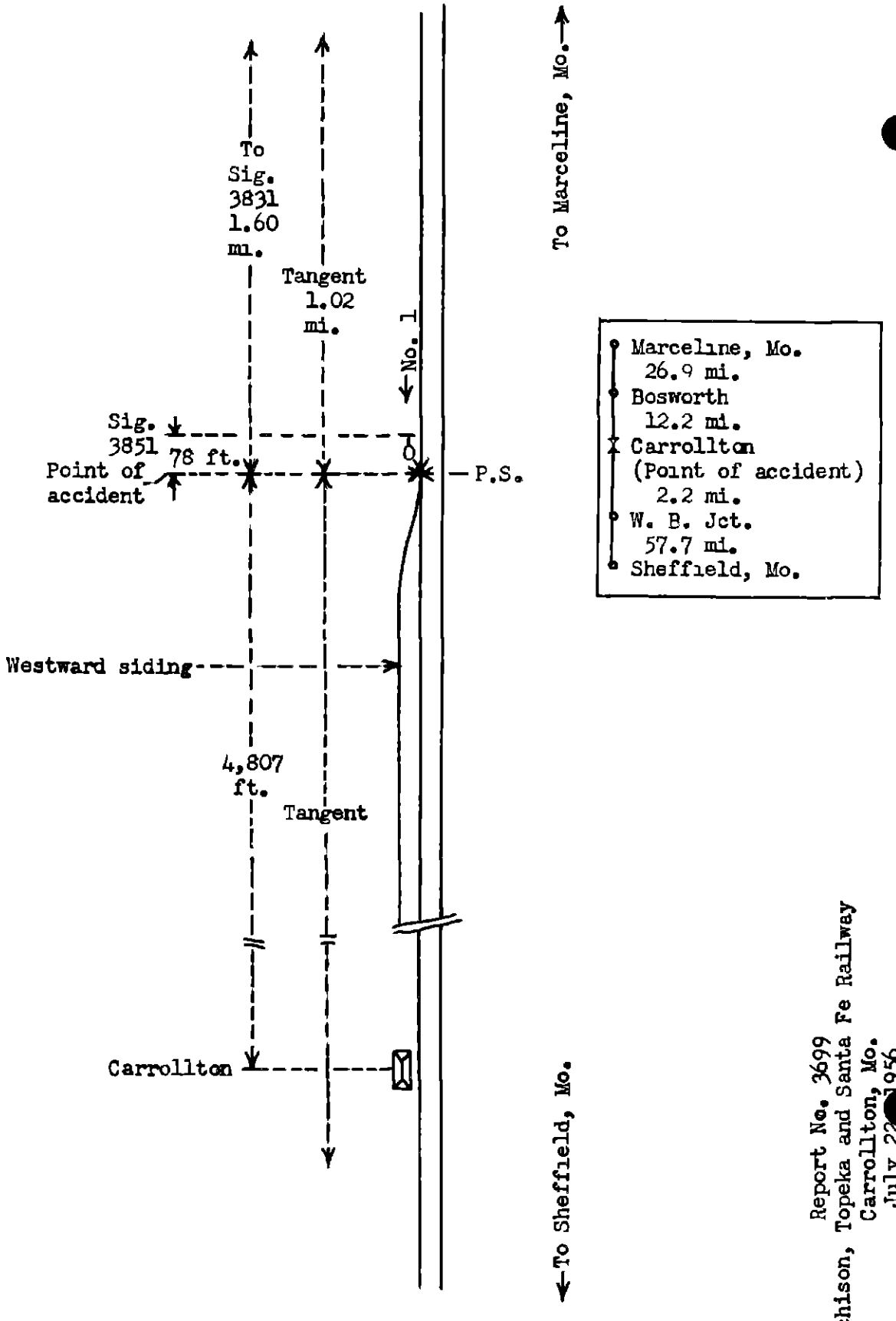
[1] Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Clarke for consideration and disposition.



Report No. 3699
Atchison, Topeka and Santa Fe Railway
Carrollton, Mo.
July 22, 1956

Location of Accident and Method of Operation

This accident occurred on that part of the Missouri Division extending between Marceline and Sheffield, Mo., 99.0 miles. In the vicinity of the point of accident this is a double-track line, over which trains moving with the current of traffic are operated by signal indications supplemented by an automatic train-stop system for passenger trains. At Carrollton, 39.1 miles west of Marceline, a westward siding parallels the westward main track on the north. The east siding-switch is 4,807 feet east of the station. The accident occurred on the main track at the east switch of the westward siding at Carrollton. The main tracks are tangent throughout a distance of 1.02 miles immediately east of the point of accident and a considerable distance westward. The grade for west-bound trains is, successively, 0.83 percent descending a distance of 1,000 feet, 0.75 percent descending 500 feet, a vertical curve 1,300 feet, and level 717 feet to the point of accident.

In the vicinity of the point of accident the track structure of the westward main track consists of 131-pound rail, 39 feet in length, laid new in 1944 on an average of 24 treated ties to the rail length. It is fully tieplated with double-shoulder canted tie plates, spiked with two rail-holding spikes and two plate-holding spikes per tie plate, and is provided with 4-hole 24-inch joint bars and an average of eight rail anchors per rail. It is ballasted with crushed stone to a depth of 10 inches below the bottoms of the ties. The main tracks are spaced 14 feet 5/8 inch between centers. There is a No. 10 turnout at the east end of the westward siding at Carrollton.

Automatic signals 3831 and 3851, governing west-bound movements on the westward main track, are located, respectively, 1.60 miles and 78 feet east of the point of accident.

Rules of the Association of American Railroads governing the loading of machinery on open top cars read in part as follows:

Rule 1. Inspection

(a) Cars must be inspected to see that they are in suitable condition to safely carry loads to destination, that loads are properly and safely secured and that all details in Rules 1 to 21, inclusive, have been complied with before loads are accepted from shippers.

* * *

Rule 15. Bolts, Nuts and Rods.

* * *

(b) To retain nuts in original position the threads on rods or bolts must be nicked immediately behind single or double nuts. When only one or two threads extend beyond nuts the ends of rods or bolts must be riveted over. Not required when nut locks or lock nuts are used.

Lock washers are not acceptable substitutes.

* * *

The maximum authorized speed for passenger trains is 90 miles per hour.

Description of Accident

No. 1, a west-bound first-class passenger train, consisted of Diesel-electric units 46C, 46B, 46A, and 46, coupled in multiple-unit control, one baggage car, five chair cars, one lunch counter dining car, one dome chair-lounge-dormitory car, one dining car, and four sleeping cars, in the order named. All cars were of lightweight steel construction. The tenth car was equipped with one tightlock coupler and one controlled slack coupler, and the other units of the train were equipped with controlled slack couplers. This train passed Bosworth, 12.2 miles east of Carrollton and the last open office, at 10:02 p. m., 3 minutes late, and while it was moving at a speed of approximately 87 miles per hour it struck a piece of machinery which had fallen onto the westward main track at a point 2,269 feet east of the east switch of the westward siding at Carrollton. The machinery was skidded ahead of the locomotive until it reached the switch, and the entire train was derailed at the switch.

Separations occurred at each end of the fourth Diesel-electric unit and at each end of each of the first seven cars. The first three Diesel-electric units stopped upright, with the front end of the first unit on the track structure of the westward main track, and the rear end of the third unit between the westward main track and the westward siding. The front end of the first unit was 996 feet west of the east siding-switch. The fourth unit

turned end for end and stopped on its right side, approximately 50 feet north of the westward main track, and opposite the rear end of the third unit. None of the derailed cars overturned. Each of the first six cars stopped across or north of the westward main track and at angles of from 45 to 90 degrees to the tracks. The other cars stopped approximately in line with the tracks. The Diesel-electric units and each of the first six cars were considerably damaged, and the other cars were somewhat damaged.

The weather was clear at the time of the accident, which occurred at 10:12 p. m.

Discussion

As No. 1 was approaching the point where the accident occurred the enginemen were maintaining a lookout ahead from their positions in the control compartment at the front of the locomotive. The members of the train crew were in the cars of the train. The headlight was lighted brightly. The brakes of the train had been tested and had functioned properly when used en route. Signals 3831 and 3851 each indicated Proceed. The enginemen said that as the train was approaching Carrollton they saw an object on the track ahead which appeared to be lying across both rails. The engineer said that when he saw that the track was obstructed he immediately initiated an emergency application of the brakes. He estimated that the object was about 400 feet distant at the time he took this action. According to the tape of the speed-recording device, effective deceleration of the train was not obtained until the locomotive was a considerable distance west of the point at which it struck the machinery. The speed had been reduced from approximately 87 miles per hour to approximately 85 miles per hour when the derailment occurred. From the analysis of the tape it appears that the brakes of the train did not become applied until after the locomotive struck the obstruction.

When the first Diesel-electric unit was examined after the accident occurred, a mark was found about 9 inches above the bottom of the pilot which indicated that the locomotive had struck an obstruction. Above this mark there were traces of green paint.

Examination of the track structure after the accident occurred disclosed that No. 1 had struck the piece of machinery at a point 2,269 feet east of the east switch of the westward siding. Westward from this point there were cuts in several ties near the center of the track. The cuts were approximately 6 inches in width and a maximum of 2 inches in

depth. They bore traces of green paint. Marks on the ties extended westward intermittently to the switch. Planks between the rails at a motor-car set-off 112 feet east of the switch had been torn out. The east gage plate of the switch had been struck a heavy blow and had driven the head rod into a tie. The clip on the head rod was twisted in such manner that the north switch point was canted and there was an opening between the switch point and the stock rail. The heel block of the north switch rail was broken and knocked out of place, and the west end of the switch rail was displaced. There were traces of green paint on parts of the switch. The end of the rail adjoining the north switch rail was badly battered. West of this point heavy flange marks appeared on both sides of both rails.

After the accident occurred a number of steel angles and castings were found in the vicinity of the east siding-switch and under the derailed equipment. These parts, which were painted green, were identified as parts of a fabricated steel tripod Sampson post which had fallen from MILW 650555, the fifty-sixth car of Extra 108 East, an east-bound freight train. This piece of machinery was one of four similar pieces which had been loaded on the car. Each consisted of a frame which supported a bearing housing at the top. The housing was supported by four 3/8-inch steel angles or legs approximately 10 feet in length. Two of these angles each measured 5 inches by 5 inches, and the other two each measured 5 inches by 3 inches. The bottom of the frame was 6 feet 5/8 inch in length, 3 feet 8-1/4 inches in width at one end, and 1 foot 8 inches in width at the other end. The bottoms of the legs were secured by horizontal steel angles. The angles along the sides measured 3 inches by 2 inches by 3/16 inch, the angle across the wider end measured 3 inches by 2 inches by 1/4 inch, and the angle across the other end measured 6 inches by 3-1/2 inches by 1/2 inch. The entire frame weighed 978 pounds. These frames are identified in this report as "A" frames.

MILW 650555 is a steel underframe 50-foot flat car. The light weight and nominal capacity are, respectively, 45,100 pounds and 100,000 pounds. At the time of the accident the lading consisted of oil well outfits and supplies weighing 86,060 pounds. Two pumping units were loaded side by side at each end of the car. The bases of the units, which were approximately 13 feet in length, were secured to the floor of the car with bolts. The ends were blocked with planking. The bases were parallel to the sides of the car. An "A" frame had been loaded on each pumping unit.

Each frame was loaded with the bottoms of the legs at the wide end of the frame resting on one end of the base of the pumping unit. The top of the "A" frame rested against the top of the pump, which was located near the opposite end of the base of the pumping unit. In this position the "A" frame was tilted toward the pump at an angle of approximately 45 degrees. The top of the frame was attached to the pump with a 3/8-inch cable. The bottom of each leg which rested on the base of the pumping unit was attached to the base by an angular bracket. Each leg of the bracket measured 3 inches by 2 inches by 1/4 inch. One 3/4-inch bolt was used to attach each bracket to a leg of the frame, and a similar bolt was used to attach the other leg of the bracket to the base of the pumping unit. The bolt holes were 1-1/16 inches in diameter.

When MILW 650555 was inspected after the accident occurred it was found that an "A" frame had fallen from the northeast corner of the car. The bolts which had secured the two legs of the frame to the brackets on the base of the pumping unit were missing, and the cable which had secured the top of the frame to the pump was broken. The bolts with which the brackets were attached to the base of the pumping unit were not tight. When the "A" frame on the southeast corner of the car was inspected it was found that the legs were resting on the base of the pumping unit but were not secured. One bracket was missing, and the other bracket was bolted to the base of the pumping unit but was not attached to the leg of the "A" frame. The lower portion of the frame had shifted toward the center of the car a distance of 4 or 5 inches. Bolts in the brackets securing the legs of the "A" frames at the opposite end of the car were not tight and could be turned without the use of tools.

MILW 650555 was one of two cars with similar lading which moved in the train of Extra 108 East on the day of the accident. After the accident occurred the lading of the other car, PRR 475256, was inspected. It was found that none of the bolts in the brackets securing the legs of the "A" frames to the bases of the pumping units was tight. Several of the bolts could be turned without the use of tools, and it was possible to tighten each one of the bolts from one and one-half to two turns by use of a 20-inch wrench.

From the fact that none of the bolts securing the legs of the "A" frames to the bases of the pumping units on either car was tight, it appears probable that the differences in the diameters of the bolts and the bolt holes resulted in the bolts becoming loosened by vibration. Lock washers had been used, but the threads behind the nuts had not been

nicked as required by the loading rules of the Association of American Railroads. Apparently the nuts worked off the missing bolts as a result of vibration. After the legs of the frame which fell from MILW 650555 were freed from the brackets they were free to shift on the base of the pumping unit, and after this occurred the cable at the top of the frame was insufficient to secure the frame in place. None of the pumping units had shifted on the floor of either car, and the lading bore no indications that either car had received an unusually severe impact.

Both cars had been loaded at a plant of the Emsco Manufacturing Company near Houston, Tex., on July 18. They were destined to Winfield, Alberta, Canada, via the Santa Fe Lines, Soo Line, and Canadian Pacific. The records of the carrier indicate that the cars were accepted for movement without having been inspected by a member of the mechanical department of the carrier. The cars received routine inspection at all inspection points en route. None of the inspectors who inspected the cars at these points took exception to the method by which the lading was secured or to the condition of the shipments. On the day of the accident the cars were assembled in the train of Extra 108 East at Argentine, Kans., 68.9 miles west of Carrollton. This train, consisting of a three-unit Diesel-electric locomotive, 89 cars, and a caboose, departed from Argentine at 6:55 p. m. and passed W. B. Jct., 2.2 miles west of Carrollton and the last open office, at 9:03 p. m. The crew of the train made no standing inspection of the train between Argentine and Carrollton, and they were not aware that any lading had fallen from the train until they inspected the train at Baring, Mo., 95.5 miles east of Carrollton.

Cause

This accident was caused by an obstruction on the track.

Dated at Washington, D. C., this seventh day of September, 1956.

By the Commission, Commissioner Clarke.

(SEAL)

HAROLD D. McCOY,

Secretary.