INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT NO. 3343

THE ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

IN RE ACCIDENT

AT MONICA, ILL., ON

JULY 6, 1950

SUMMARY

Date:	July 6, 1950	
Railroad:	Atchison, Topeka and Santa Fe	
Location:	Monica, Ill.	
Kind of accident:	Derailment and collision	
Trains involved:	Passenger	: Passenger
Train numbers:	22	: 10
Engine numbers:	Diesel-electric units 29, 29A, 29B, 29C	: Diesel-electric units 6, 50A
Consists:	16 cars	: 13 cars
Estimated speeds:	90 m. p. h.	: 55 m. p. h.
Operation:	Signal indications	
Tracks:	Double; tangent; level	
Weather:	Clear	
Time:	4:40 a. m.	
Casualties:	9 killed; 134 injured	
Cause:	Dragging equipment, and derailed car obstructing adjacent main track in front of approaching train	

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3343

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, 1950

Accident at Monica, Ill., on July 6, 1950, caused by dragging equipment, and by a derailed car obstructing an adjacent main track in front of an approaching train.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On July 6, 1950, there was a derailment of a passenger train, and a collision between derailed cars of that train and a passenger train moving in the same direction on an adjacent main track, on the Atchison, Topeka and Santa Fe Railway at Monica, Ill., which resulted in the death of 9 passengers, and the injury of 109 passengers, 2 Pullman employees and 23 dining-car employees. This accident was investigated in conjunction with a representative of the Illinois Commerce Commission.

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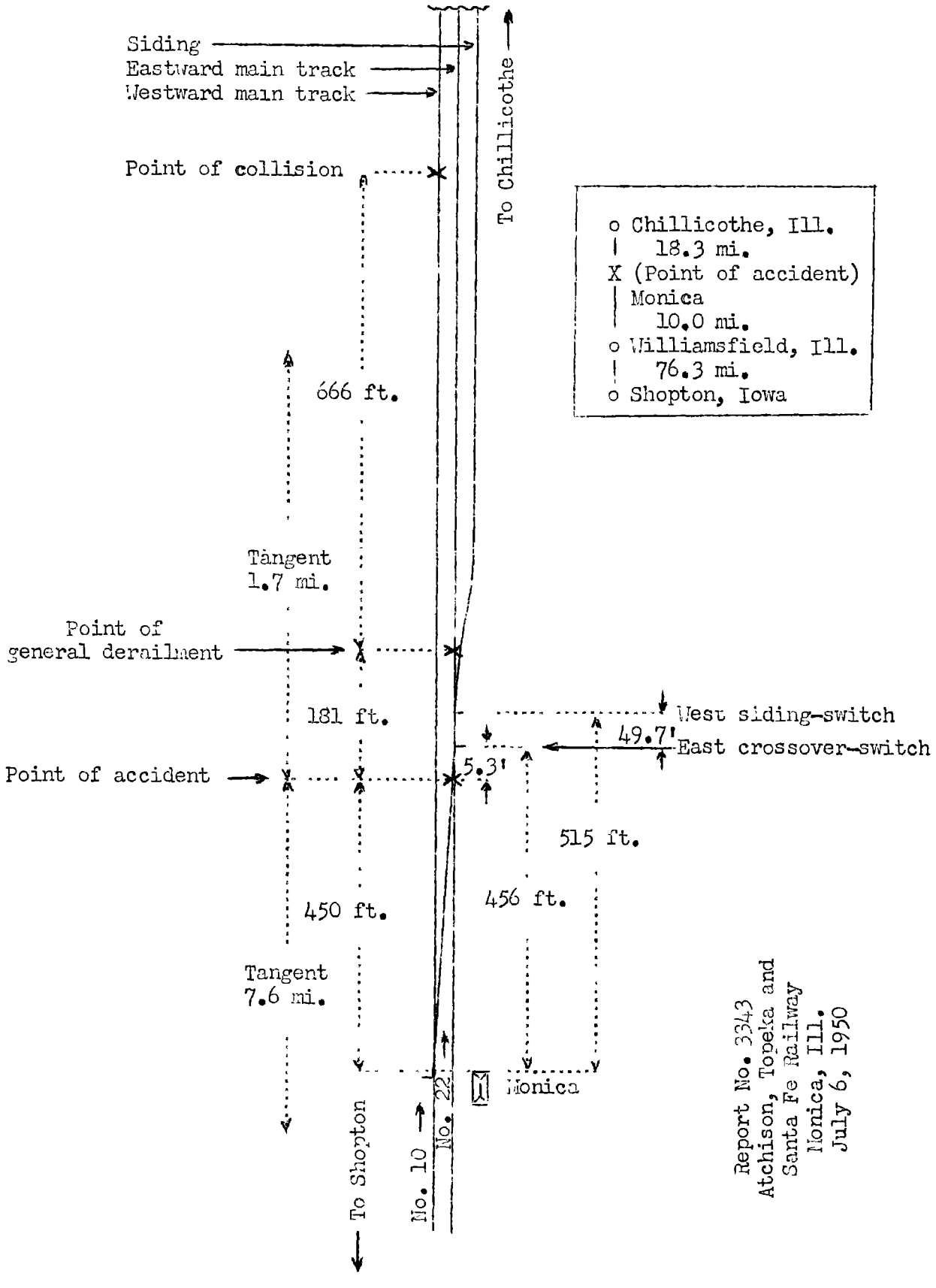
[1] Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.



Report No. 3343
Atchison, Topeka and
Santa Fe Railway
Monica, Ill.
July 6, 1950

Location of Accident and Method of Operation

This accident occurred on that part of the Illinois Division extending between Shopton, Iowa, and Chillicothe, Ill., 104.6 miles. In the vicinity of the point of accident this is a double-track line, over which trains are operated in either direction on either track by automatic cab signal indications and an automatic train-control system of the three-speed continuous-inductive type. There are no wayside signals except at interlockings. From south to north the main tracks are designated as eastward and westward. At Monica, Ill., 86.3 miles east of Shopton, a siding, designated as the eastward siding, parallels the eastward main track on the south. The west switch of this siding is located 815 feet east of the station. The east switch of a crossover, which connects the eastward and westward main tracks, is located 456 feet east of the station. This switch is trailing-point for east-bound movements on the eastward main track. The initial derailment occurred on the eastward main track 450 feet east of the station at Monica, and the general derailment occurred 181 feet eastward. The collision occurred on the westward main track 606 feet east of the point of general derailment. From the west the main tracks are tangent 7.6 miles to the point of accident and 1.7 miles eastward. In the vicinity of the point of accident the grade is practically level.

At the point of accident the track structure consists of 132-pound rail, 39 feet in length, laid on an average of 24 ties per rail length. It is fully tieplated with double-shoulder tieplates, double-spiked, and is provided with 6-hole 36-inch joint bars and an average of 12 rail anchors per rail length. It is ballasted with gravel to a depth of 10 to 12 inches below the tops of the ties.

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

> 102. When a train is parted, disabled or stopped suddenly by an emergency application of the air brakes * * * adjacent tracks * * * that are liable to be obstructed must at once be protected until it is ascertained they are safe and clear for the movement of trains.
>
> * * *
>
> 815. * * *

Trainmen must inspect their trains frequently while running and when standing, to detect * * * defects. They must observe meeting and passing trains to detect and call attention to anything that might endanger the operation of such trains, giving stop signals if necessary.

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ENGINEMEN AND FIREMEN.

891. They must look back frequently, and especially while rounding curves * * * to detect any defects in their train * * *

* * *

Operators.

918. When their duties permit, they will be outside to observe passing trains. If anything is seen which might endanger the same, stop signals will be given * * *

The maximum authorized speed for the trains involved in this accident was 90 miles per hour.

Description of Accident

No. 22, an east-bound first-class passenger train, consisted of Diesel-electric units 29, 29A, 29B and 29C, coupled in multiple-unit control, one mail-baggage car, one mail car, one baggage car, one baggage-dormitory car, three chair cars, one dining car, two chair cars, one lounge car, two chair cars, one dining car, one chair car and one chair-observation car, in the order named. All cars were of lightweight stainless-steel construction. This train departed from Shopton on the eastward main track at 3:07 a. m., 7 minutes late, and passed Williamsfield, the last open office, 10 miles west of Monica, at 4:32 a. m., 18 minutes late. It passed No. 10 immediately west of Monica, and while moving at a speed of 90 miles per hour the rear wheels of the rear truck of the first car were derailed. A general derailment of the second to the sixteenth cars, inclusive, occurred 181 feet eastward. One or more of the derailed cars obstructed the westward main track. Immediately after the general derailment occurred the tenth car of No. 22 was struck by No. 10.

No. 10, an east-bound first-class passenger train, consisted of Diesel-electric units 6 and 50A, coupled in multiple-unit control, two baggage cars, four chair cars, one lounge car and six sleeping cars, in the order named. The first and the seventh cars were of all-steel construction, the second car was of steel-underframe construction, and the other cars were of lightweight-steel construction. This train departed from Shopton on the eastward main track at 2:50 a. m., 15 minutes late, and passed Williamsfield at 4:27 a. m., 24 minutes late. It was diverted to the westward main track at Williamsfield, proceeded eastward, and while moving at an estimated speed of 55 miles per hour it struck the tenth car of No. 22.

The rear truck of the first car, the second to the fifteenth cars, inclusive, and the front truck of the sixteenth car of No. 22 were derailed. Separations occurred between all adjacent units from the third to the twelfth cars. The first car remained coupled to the engine, which stopped 2,645 feet east of the point of accident. The rear truck of the first car and all wheels of the second and third cars were derailed to the south. The second and third cars stopped upright, west of the first car, and parallel and adjacent to the eastward main track. The fourth car stopped with the east end 950 feet west of the west end of the third car. The east end of this car was on the roadbed of the eastward main track and the west end was about 20 feet south of the eastward main track. It leaned to the south at an angle of 15 degrees. The fifth car stopped upright and on the roadbed, with the east end 70 feet west of the west end of the fourth car. The sixth car stopped upright, at an angle of about 45 degrees to the tracks, and to the rear of the fifth car. The east and west ends of this car were, respectively, 2 feet and 55 feet south of the center-line of the eastward main track. The seventh car stopped upright, against the sixth car, across the tracks and at an angle of 90 degree to them. The front end of this car was 62 feet south of the eastward main track. The eighth car stopped upright, against the seventh car, across the tracks and at an angle of 45 degrees to them. The west end of this car was 32 feet south of the eastward main track. The ninth car stopped parallel to and against the eighth car. The west end of this car was 35 feet south of the eastward main track. The tenth car stopped upright and across the westward main track. The south side of this car was against the ends of the eighth and ninth cars, and the north side was against the second Diesel-electric unit and the first car of No. 10. The other cars were derailed to the right,

except the last truck of the last car. These cars stopped upright and approximately in line with the tracks. The east end of the eleventh car was about 785 feet east of the point of accident. The fourth to the tenth cars, inclusive, were badly damaged, and the other cars of this train were somewhat damaged.

The Diesel-electric units and the first three cars of No. 10 were derailed to the left. Separations occurred between the Diesel-electric units, between the second Diesel-electric unit and the first car, and between the third and fourth cars. The Diesel-electric units stopped upright and 214 feet east of the point of collision. The front end of the first unit stopped 40 feet north of the westward main track, and the rear end of the second unit stopped 5 feet north of the westward main track. The first car stopped upright and to the rear of the second Diesel-electric unit. The south side of this car was parallel to and against the north side of the tenth car of No. 22. The second and third cars stopped upright and to the rear of the first car. These cars were approximately in line with the westward main track. The Diesel-electric units and the first three cars were somewhat damaged.

The eastward main track was destroyed throughout a distance of about 800 feet east of the point of general derailment. In the vicinity of the point of collision the westward main track was destroyed throughout a distance of about 300 feet.

The weather was clear at the time of the accident, which occurred about 4:40 a. m.

The first car of No. 22, baggage-mail car 3405, is of lightweight stainless-steel construction, and was built in 1945. It is 73 feet 8 inches long between the coupler faces, and its light weight is 100,765 pounds. It is provided with two 4-wheel trucks spaced 48 feet 2 inches between truck centers. The wheel base of each truck is 9 feet in length. The specified diameters of the wheels is 36 inches. The truck side-frames and pedestals are cast integrally. Each truck frame has four cross-members consisting of two transoms and two truck ends. The journals are 6 inches by 11 inches and are provided with roller bearings. The trucks are equipped with single bolsters having integral centerplates. These bolsters are equipped with anchors and stabilizing devices. Shock absorbers are provided at each end of each bolster. The equalizers are of the bottom type and extend between the journal boxes on each side of each truck. They are curved upward at each end and are seated upon the tops of the journal boxes. The spring arrangement consists of two helical springs seated upon each equalizer bar near each end, and two helical springs at each end of each bolster. Each truck is equipped with two roller-type side-bearings.

The trucks of this car are equipped with disc-type brakes. A disc, 28 inches in diameter and having two parallel faces 4 inches apart, is attached parallel to the inside of each wheel by a hub which is cast integrally with the disc. Multiple fins are cast between the faces of the disc to provide ventilation. Each pair of wheels is provided with a brake-frame assembly. The brake-frame assembly is supported at each end by C-shape arms, which bear on the tops and bottoms of the journal boxes adjacent to and inside the pedestal jaws. It is supported at the center by a hanger box. The hanger box overlaps the truck transom and is attached to it by two vertical and two horizontal cap bolts 7/8 inch in diameter. Each brake-frame assembly has two brake cylinders. The movement of the brake-cylinder pistons is transmitted to the brake shoes through links. The links are so arranged that equal pressure is applied by the brake shoes on both faces of each disc when the brakes are applied. The brake-frame assembly involved was applied August 6, 1949.

Discussion

As No. 22 approached the point where the accident occurred the speed was 90 miles per hour, as indicated by the speed recording device. The brakes of this train had been tested and had functioned properly when used en route. The enginemen were maintaining a lookout ahead from their respective positions in the control compartment of the first Diesel-electric unit, the conductor was in the fifth car and the brakeman was in the last car. Before the accident occurred, the Diesel-electric units and the cars had been riding smoothly. The engineer and the fireman inspected the train on curves en route, and they did not observe anything defective. The operator at Williamsfield inspected the train as it passed that station, and he gave no signal to indicate defective equipment. The crew of No. 10 inspected No. 22 as it passed and they did not observe anything defective. When the derailment occurred, the brakes became applied in emergency before the engineer could take action to stop the train. Before any protection could be provided on the adjacent track, the tenth car was struck by No. 10.

As No. 10 approached the point where the collision occurred the speed was about 70 miles per hour. The brakes of this train had been tested and had functioned properly when used en route. The enginemen were maintaining a lookout ahead from their respective positions in the control compartment of the first Diesel-electric unit, the conductor was in the third car and the brakeman was in the twelfth car. The rear

end of No. 22 passed the front end of No. 10 approximately 1,200 feet west of the station at Monica. After No. 10 had proceeded about 500 feet eastward, the engineer observed that the view of No. 22 became obstructed by dust. He immediately initiated an emergency brake application, and the speed of the train was reduced to about 55 miles per hour when the collision occurred.

Examination of the eastward main track throughout a considerable distance immediately west of the point of accident disclosed that it was well maintained. There was no indication of any obstruction having been on the track. The first indication of dragging equipment was a damaged bond wire on the north rail, 4,145 feet west of the point of accident. From this point eastward to the crossover turnout east of the station at Monica the track structure showed indications of dragging equipment at various locations. Between these points, the center and the outside planks of road crossings were marked. The lead rail of the crossover turnout east of Monica had metal burn marks on the south side. The first mark of derailment was a flange mark on the gage side of the south rail. This mark started 5.3 feet west of the point of the east switch of the crossover and continued diagonally on the top of the rail a distance of 14.9 feet to the outside of the rail. At a point beginning 9.6 feet east of this mark, the ties and tieplates bore marks indicating that one pair of wheels had become derailed to the south. These marks continued throughout a distance of 30.5 feet to the point-of-switch of the eastward-siding turnout. The open point of the switch of the turnout bore flange marks, and it was bent to the north. The lead rail of this turnout was broken and moved out of normal alinement. The point of the turnout frog bore a deep flange mark. The general derailment occurred 16.9 feet east of the point-of-frog.

Examination of the equipment of No. 22 disclosed that the rear brake-frame assembly hanger box of the rear truck of the first car had become detached from the transom. The brake-frame assembly had been forced downward and had been in contact with the track structure. Chafing marks on the transom indicated that the hanger-box connection was loose before the accident occurred. However, the left horizontal hanger-box cap bolt was missing and the threads in the transom indicated that the bolt had been pulled out. The right horizontal hanger-box cap bolt was broken. The missing part of this bolt was found 2,580 feet west of the point of accident. The left vertical hanger-box cap bolt was broken, and there was a progressive fracture covering 70 percent of the cross-sectional area of the bolt. Failure of the right vertical

hanger-box cap bolt was caused by a twisting action. That part of the hanger box normally bearing on top of the transom was broken and was not recovered. All brake shoes of the brake-frame assembly were broken. The left brake disc was destroyed. The inside face, the ventilating fins and part of the outside face of the right brake disc also were destroyed. The broken pieces of the brake shoes and the brake discs which were recovered did not show any indication of overheating or excessive wear, and all breaks were new. The condition of the brake-frame assembly was such that the damage before the accident occurred could not be determined. As a result, the cause of the failure of the cap bolts could not be determined.

Since the accident occurred, the carrier has issued instructions to weld the hanger box to the transom, and to apply safety chains, temporarily, on future applications of this type of brake assembly. As a permanent measure, safety supports made of metal straps will be installed as rapidly as possible. The carrier also has issued instructions to remove for inspection once each year all trucks equipped with this type of brake assembly.

Cause

It is found that this accident was caused by dragging equipment, and by a derailed car obstructing an adjacent main track in front of an approaching train.

Dated at Washington, D. C., this seventh day of September, 1950.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,

Secretary.