INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT NO. 3433

CHICAGO, INDIANAPOLIS AND LOUISVILLE RAILWAY COMPANY

IN RE ACCIDENT

AT MONON, IND., ON

SEPTEMBER 17, 1951

SUMMARY

Date:	September 17, 1951
Railroad:	Chicago, Indianapolis and Louisville
Location:	Monon, Ind.
Kind of accident:	Derailment
Train involved:	Passenger
Train number:	5
Engine numbers:	Diesel-electric units 85B, 85A, 81B, and 82A
Consist:	7 cars
Speed:	64 m. p. h.
Operation:	Timetable, train orders and automatic block-signal system
Track:	Single, 9°42' curve; 0.09 percent descending grade southward
Weather:	Clear
Time:	3:16 p. m.
Casualties:	1 killed; 11 injured
Cause:	Excessive speed on curve

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3433

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

CHICAGO, INDIANAPOLIS AND LOUISVILLE RAILWAY COMPANY

January 8, 1952

Accident at Monon, Ind., on September 17, 1951, caused by excessive speed on a curve.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On September 17, 1951, there was a derailment of a passenger train on the Chicago, Indianapolis and Louisville Railway at Monon, Ind., which resulted in the death of one train-service employee, and the injury of two passengers, one operator, one station employee, five train-service employees, and two other persons. This accident was investigated in conjunction with representatives of the Indiana Public Service Commission.

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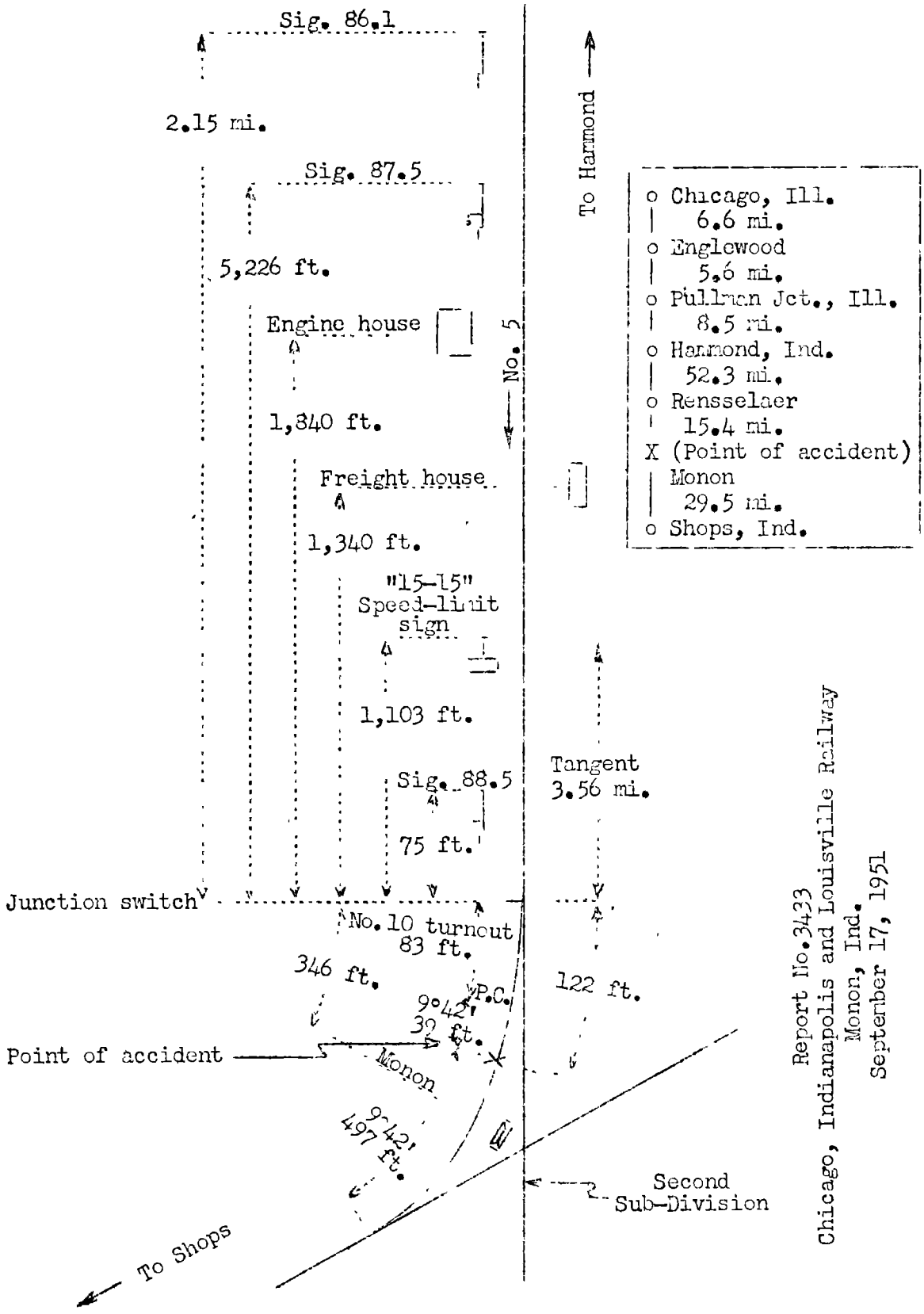
[1] Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.



Report No. 3433
Chicago, Indianapolis and Louisville Railway
Monon, Ind.
September 17, 1951

Location of Accident and Method of Operation

This accident occurred on that part of the Northern Division designated as the First Sub-Division and extending between Hammond and Shops, near Lafayette, Ind., 97.2 miles. In the vicinity of the point of accident this is a single-track line, over which trains are operated by timetable, train orders and an automatic block-signal system. At Monon, 67.7 miles south of Hammond, a line designated as the Second Sub-Division joins the main track of the First Sub-Division. The junction switch, which is facing-point for south-bound movements, is located 346 feet north of the station. The accident occurred on the main track of the First Sub-Division at a point 122 feet south of the junction switch. From the north there are, in succession, a tangent 3.56 miles in length, a No. 8 turnout to the right 83 feet, and a 9°42' curve to the right 39 feet to the point of accident and 479 feet southward. The grade varies between 0.06 percent and 0.61 percent descending southward throughout a distance of 4,172 feet immediately north of the point of accident, and is 0.09 percent descending southward at that point.

On the curve on which the accident occurred the track structure consists of 115-pound rail, 39 feet in length, laid new in June, 1951, on an average of 22 treated hardwood ties to the rail length. It is fully tieplated with double-shoulder tieplates and is spiked with three rail-holding spikes and one anchor spike per tieplate. It is provided with 6-hole 36-inch joint bars. There are 3 gage rods and an average of 12 rail anchors per rail length. It is ballasted with crushed stone to an average depth of 6 inches below the bottoms of the ties. At the point of derailment the superelevation was 1/4 inch and the gage was 4 feet 8-1/2 inches.

The turnout consists of 100-pound relay rail, 16½-foot switch rails, a No. 8 solid manganese steel self-guarded frog, and an 11-foot guard rail. The frog angle is 7°19'. The turnout is fully tieplated with single-shoulder tieplates and is spiked with three rail-holding spikes per tieplate. It is provided with 4-hole 24-inch joint bars and an average of 11 rail anchors per rail length. It is ballasted with crushed stone to an average depth of 6 inches below the bottoms of the ties. The normal position of the switch is for movements on the First Sub-Division.

Automatic signals 86.1, 87.5, and 88.5, governing south-bound movements, are located, respectively, 2.15 miles, 5,226 feet, and 75 feet north of the junction switch. Signals 86.1 and 87.5 are of the one-arm upper-quadrant semaphore type, and signal 88.5 is of the two-arm upper-quadrant semaphore type. The controlling circuits are so arranged that when the blocks

of the signals are clear and the junction switch is lined for movement on the First Sub-Division, each signal indicates Proceed.

A number of auxiliary tracks parallel the main track on each side between signals 87.5 and 88.5. A speed-limit sign, governing south-bound movements, is located west of the auxiliary track adjacent to the main track on the west. This sign is 30 feet west of the center-line of the main track and 1,103 feet north of the junction switch. It is 15 inches in height and 36 inches in length, is mounted on a mast and is 5 feet 6 inches above the level of the tops of the rails. It bears the numerals "15-15" in black on a yellow background. The passenger station at Monon was a one-story stone and brick building located between the main tracks of the First and the Second Sub-Divisions. The west side of the building was 27 feet east of the center-line of the main track of the First Sub-Division.

The maximum authorized speed for passenger trains was 75 miles per hour, but it was restricted to 15 miles per hour between signal 88.5 and the south end of the curve on which the accident occurred.

Description of Accident

No. 5, a south-bound first-class passenger train, consisted of Diesel-electric units 85B and 85A, coupled in multiple-unit control, Diesel-electric units 81B and 82A, coupled in multiple-unit control, one baggage car, one baggage-mail car, three coaches, one grill-parlor car, and one business car, in the order named. All cars were of all-steel construction. This train departed from Rensselaer, the last open office, 15.4 miles north of Monon, at 3.02 p. m., 28 minutes late, passed signals 86.1, 87.5, and 88.5, each of which indicated Proceed, and while moving on the 9°42' curve at Monon at a speed of 64 miles per hour the two Diesel-electric locomotives and the rear truck of the first car were derailed at a point 122 feet south of the junction switch.

The first unit of the first Diesel-electric locomotive struck and demolished the station building. It stopped on its left side and parallel to the main track of the First Sub-Division, with its front end 28 feet east of the center-line of the track and 277 feet south of the point of derailment. The second unit stopped on its left side and at right angles to the track, with its front end toward the west and 27 feet east of the center-line of the track and 206 feet south of the

point of derailment. The first unit of the second locomotive stopped on its left side, on the main track of the Second Sub-Division and practically in line with it, with its front end about 255 feet south of the point of derailment. The second unit stopped upright, with its rear end 8 feet east of the center-line of the track and 190 feet south of the point of derailment, and its front end 42 feet east of the track and 149 feet south of the point of derailment. There were no separations between the cars of the train. They stopped with the front of the first car 400 feet south of the point of derailment. Each of the four Diesel-electric units was badly damaged, and the first car was somewhat damaged.

The engineer of the first locomotive was killed. The fireman of the first locomotive, the engineer and the fireman of the second locomotive, the conductor, the front brakeman, the operator at Monon, and one station employee at Monon were injured.

The weather was clear at the time of the accident, which occurred at 3:16 p. m.

The Diesel-electric units involved are of the 0-4-4-0 type. Each unit is 50 feet 8 inches in length, and each is provided with a control compartment. The trucks are of the swing-motion type. The wheelbase of each truck is 9 feet, and the centers of the trucks of each unit are spaced 30 feet apart. The specified diameter of the driving wheels is 40 inches. The weights of units 85B, 85A, 81B, and 82A in working order are, respectively, 233,080 pounds, 233,080 pounds, 232,500 pounds, and 232,500 pounds. The center of gravity of each unit is 63 inches above the level of the tops of the rails. The theoretical overturning speed of each of these units moving on a 9°42' curve having a 1/4-inch superelevation is 54 miles per hour.

The Diesel-electric units are provided with 24-RL brake equipment. Each unit is equipped with a speed indicator and speed recording device, an overspeed control, and a safety-control feature. The regulating devices were adjusted for 110-pound brake-pipe pressure and 140-pound main-reservoir pressure. The overspeed control of unit 85B was adjusted to cause a service brake-pipe reduction and to reduce the engines to idling speed if a speed of about 69 miles per hour was exceeded. An emergency brake-valve is provided at the rear door of each unit. When an emergency application of the brakes occurs, the power is automatically shut off. The cars of the train are provided with UC-12-BD brake equipment.

Discussion

As No. 5 was approaching Monon the speed was 68 miles per hour. The enginemen of the first locomotive were in their respective positions in the control compartment at the front of the first locomotive, the enginemen of the second locomotive were in the control compartment at the front of the second locomotive, the front brakeman was in the third car, the conductor was in the fourth car, and the flagman was in the rear car. The brakes of the train were in the charge of the engineer of the first locomotive. The fireman of the first locomotive said that when the train was in the vicinity of signal 86.1 he reminded the engineer that they were approaching Monon. The engineer closed the throttle, but took no further action to reduce the speed of the train. When the train was in the vicinity of signal 87.5 the fireman reminded the engineer that a brake application should be made. The engineer immediately made a light brake-pipe reduction. Several seconds later the fireman told the engineer that he did not think the speed of the train was being properly controlled. The engineer told the fireman that he, the engineer, would operate the locomotive, and shortly afterward he released the brakes and opened the throttle. The fireman then crossed to the engineer's side of the control compartment and closed the throttle. He reached for the brake valve, but the engineer forcibly prevented him from making a brake application. The accident occurred before the fireman could take further action. The engineer of the second locomotive said that he closed the throttle when the train was in the vicinity of signal 86.1. He said that when operating south-bound passenger trains he customarily made a brake application in the vicinity of signal 87.5. He observed that the engineer of the first locomotive did not make a brake application at the point at which he would have done so, but, because he disliked to interfere with the other engineer's handling of the brakes, he hesitated for several seconds before taking action. He then opened the double-heading cock with the intention of making a service brake-pipe reduction. Before he had completed this operation he realized that he could not obtain an effective service brake-pipe reduction if the brake valve of the first locomotive was in running position. He then placed the brake valve in emergency position. He thought that the train was about 1,800 feet north of the junction switch at the time he made the brake application. The accident occurred before the speed had been materially reduced. The conductor said that he entered the front vestibule of the fourth car

at a point about 1,300 feet north of the junction switch. Until he opened the vestibule door, he had not noticed that the train was approaching the switch at a higher speed than usual. He immediately sounded a stop signal on the communicating signal system. The accident occurred before he could reach the conductor's valve, which was located inside the coach. The train was closely approaching the junction switch before either the front brakeman or the flagman became aware that the speed was not being properly controlled, and they then had insufficient time to take action to stop the train before the accident occurred.

According to the tapes of the speed recording devices, the Diesel-electric units overturned while moving at a speed of 64 miles per hour, 10 miles per hour in excess of the theoretical overturning speed at the point of accident. After the accident occurred, examination of the junction switch and of the track throughtout a considerable distance north of the point of accident disclosed no indication of dragging equipment or of an obstruction having been on the track. Examination of the equipment of No. 5 disclosed no condition which would have contributed to the cause of the accident. The brake equipment of the Diesel-electric units was so badly damaged in the accident that the brakes could not be tested. When the control portions of the air-brake equipment were removed from Diesel-electric units 85B and 81B and placed on another Diesel-electric unit of the same type, they were found to function properly. The brakes of the cars of the train were tested after the accident occurred, and they functioned properly.

The engineer of the first locomotive was killed in the accident, and the investigation disclosed no explanation for his failure to control the speed properly as the train was approaching Monon. The crew of No. 5 reported for duty at Chicago, Ill., 20.7 miles north of Hammond, at 12:30 p. m. The conductor did not see the engineer of the first locomotive before the train departed from Chicago, but each of the other members of the crew talked with him. They said that there was nothing unusual in his speech or actions. The brakes of the train were tested at Chicago, and the train departed at 1 p. m., on time. The brakes functioned properly when stops were made at Englewood, 14.1 miles north of Hammond, at Pullman Jct., 8.5 miles north of Hammond, and at Hammond. At a point 22.6 miles south of Hammond the train attained a speed of 70 miles per hour and was stopped by the functioning of the overspeed control. After the train departed from that point the flagman observed that the brakes of the rear car

had not released and the wheels were sliding. He stopped the train at a point about 1/2 mile farther south by opening the valve of the back-up hose. When the brakes were released, the train proceeded southward. After the second unscheduled stop, the engineer of the second locomotive proceeded to the control compartment of the first locomotive to ascertain the cause for the two stops. When he reached the control compartment he thought that the engineer of the first locomotive acted as though he was sick and he offered to operate the locomotive during the remainder of the trip. The engineer of the first locomotive replied that there was nothing wrong and that he did not require assistance. Both engineers remained in the control compartment of the first locomotive until the train reached Rensselaer. During this time the train attained a speed of 70 miles per hour on two occasions, and the overspeed control functioned each time. The engineer of the second locomotive and the fireman of the first locomotive said that although it was unusual for a train so frequently to exceed the speed permitted by the overspeed control, they were not concerned by the manner in which the engineer operated the locomotive. The fireman said that the overspeed controls of the locomotives used on No. 5 were usually adjusted to permit a speed of 79 miles per hour and he thought that the engineer was unaccustomed to having the overspeed control function at a speed of 69 miles per hour. The engineer of the second locomotive thought that the other engineer was attempting to operate the train at the maximum speed permitted by the overspeed control and that the overspeed control functioned when the train only slightly exceeded that speed. When the train reached Rensselaer the engineer of the second locomotive was satisfied that the other engineer was not ill, and he returned to the control compartment of the second locomotive at that point. After the train departed from Rensselaer a speed of about 68 miles per hour was maintained until the train passed signal 86.1. The fireman said that there was nothing unusual in the actions of the engineer or in the manner in which he operated the locomotive until the train was approaching signal 86.1. When the fireman called the indication of this signal the engineer did not respond, and the engineer failed to close the throttle or to make a brake application when the train passed the points at which he usually did so. However, the engineer responded immediately when the fireman reminded him to close the throttle and to make a brake application. The members of the train crew said that with the exception of the reductions

in speed and the stops caused by the functioning of the overspeed control they noticed nothing unusual in the handling of the train until immediately before the accident occurred.

Cause

It is found that this accident was caused by excessive speed on a curve.

Dated at Washington, D. C., this eighth day of January, 1952.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,

Secretary.