INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 2825

THE SOUTHERN RAILWAY SYSTEM

REPORT IN RE ACCIDENT

NEAR AVENSTOKE, KY., ON

SEPTEMBER 4, 1944

SUMMARY

Railroad:	Southern
Date:	September 4, 1944
Location:	Avenstoke, Ky.
Kind of accident:	Derailment
Train involved:	Freight
Train number:	Third 59
Engine number:	4526
Consist:	24 cars, caboose
Estimated speed:	40 m. p. h.
Operation:	Timetable and train orders
Track:	Single; 6°15' curve; 0.76 percent ascending grade eastward
Weather:	Clear
Time:	3:45 p. m.
Casualties:	3 killed
Cause:	Probably result of improper distribution of spring-borne weight of locomotive

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2825

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

THE SOUTHERN RAILWAY SYSTEM.

November 20, 1944.

Accident near Avenstoke, Ky., on September 4, 1944, probably caused by improper distribution of the spring-borne weight of the locomotive.

REPORT OF THE COMMISSION[1]

PATTERSON, Chairman:

On September 4, 1944, there was a derailment of a freight train on the line of the Southern Railway System near Avenstoke, Ky., which resulted in the death of three employees.

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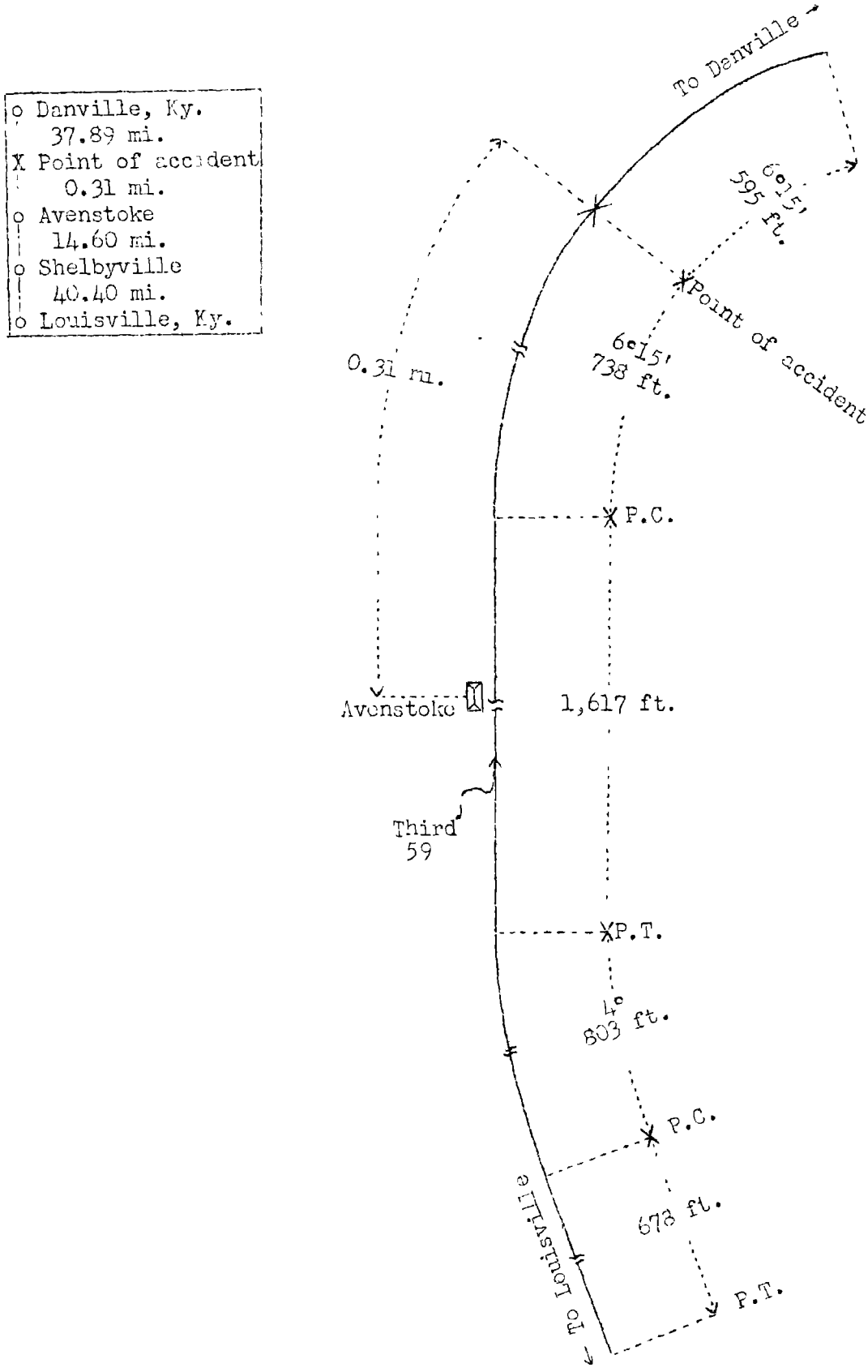
[1]Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Chairman Patterson for consideration and disposition.



Inv. No. 2825
Southern Railway
Avenstoke, Ky.
September 4, 1944

Location of Accident and Method of Operation

This accident occurred on that part of the Louisville Division extending eastward from Louisville to Danville, Ky., 93.2 miles. In the vicinity of the point of accident this was a single-track line over which trains were operated by timetable and train orders. There was no block system in use. The accident occurred 55.31 miles east of Louisville, at a point 0.31 mile east of the station at Avenstoke. From the west there were, in succession, a tangent 678 feet in length, a 4° curve to the right 803 feet, a tangent 1,617 feet and a 6°15' curve to the right 738 feet to the point of accident and 595 feet beyond. The grade for east-bound trains was level 3,000 feet, then it was 0.76 percent ascending 1,610 feet to the point of accident and some distance beyond.

On the curve the track structure consisted of 100-pound rail, 33 feet in length, laid in 1940 on 18 treated ties to the rail length. It was fully tieplated, double-spiked inside and single-spiked outside each rail, provided with 4-hole angle bars, 8 rail anchors and 4 gage rods per rail length, and was ballasted with crushed stone to a depth of 18 inches. The maximum superelevation on the curve was 6-1/2 inches and the gage varied between 4 feet 8-1/2 inches and 4 feet 8-3/4 inches. The superelevation at the point of derailment was 6-1/4 inches and the gage was 4 feet 8-3/4 inches.

The maximum authorized speed for freight trains was 50 miles per hour, and on the curve involved, 40 miles per hour.

Description of Accident

Third 59, an east-bound second-class freight train, consisted of engine 4576, a 2-8-2 type, 24 cars and a caboose. This train departed from Shelbyville, 14.6 miles west of Avenstoke and the last open office, at 2:47 p. m., 5 hours 12 minutes late, passed Avenstoke, and while moving at an estimated speed of 40 miles per hour the engine and the first 14 cars were derailed.

The engine and tender stopped on their left sides, north of the track and parallel to it, with the front end of the engine 448 feet east of the point of accident, and were considerably damaged. The first 14 cars were demolished.

It was clear at the time of the accident, which occurred about 3:42 p. m.

The engineer, the fireman and the front brakeman were killed.

The total weight of engine 4526 in working order was 272,940 pounds, normally distributed as follows: Engine truck, 22,860 pounds; No. 1 driving wheels, 54,200 pounds; No. 2 driving wheels, 54,940 pounds; No. 3 driving wheels, 52,540 pounds; No. 4 driving wheels, 54,020 pounds; and trailer truck, 34,380 pounds. The diameters of the engine-truck wheels, the driving wheels, and the trailer-truck wheels were, respectively, 33, 63, and 42 inches. The tender was equipped with four-wheel trucks. The rigid wheelbase of the engine was 16 feet 6 inches long, and the total length of the engine and tender was 77 feet 0-7/8 inch. The center of gravity was 71-1/2 inches above the top of the rails.

Discussion

Third 59 was moving at a speed of about 40 miles per hour when the engine and the first 14 cars were derailed on a 6°15' curve to the right, having a maximum superelevation of 6-1/2 inches. The maximum authorized speed on the curve was 40 miles per hour. There was no indication of dragging equipment, defective track, or of any obstruction having been on the track. It could not be determined when the enginemen and the front brakeman first became aware of anything being wrong, as they were killed in the accident.

Examination of the track disclosed that beginning at a point 738 feet east of the west end of the curve a flange mark appeared on the ties 6 inches inside the gage side of the high rail. Opposite this mark a flange mark appeared on the outer edge of the top of the head of the low rail. From this point eastward and extending approximately 160 feet to the point where the general derailment occurred, tread marks appeared on the heads of the spikes and on the west ends of the angle bars inside the high rail, and flange marks appeared on the outside of the base of the low rail. East of this point the track was torn up to the point where the engine stopped. Throughout a distance of 167 feet immediately west of the first mark on the track structure the track had been forced out of normal alinement northward from 1-1/8 inches to 2 inches. Marks on the outer edge of the tread and on the outer face of the counterbalance of the left No. 1 driving wheel and marks on the inner edges of the driving wheels indicated that the No. 1 driving wheels were the first to be derailed.

Examination of the engine disclosed that the pedestal frame of the left No. 2 driving box had been previously broken and welded. Marks on the welding material at this location and marks on the upper portion of the frame bearing-surface of the driving-box shoe indicated that the frame and the shoe had been in close contact. The pedestal frame of the left No. 3 driving box also had been previously broken and welded. After the accident, the frame was found broken

at this weld. The wearing surfaces of the shoe and the wedge of the left intermediate driving box were uneven, and they bore indications that they had been overheated.

The investigation disclosed that during a considerable period prior to the day of the accident engineers operating engine 4526 had complained about its rough riding qualities. Records of the carrier indicated that during a period of 9 days immediately prior to the accident engineers had reported to the mechanical forces that the action of engine 4526 on curves was abnormal. On August 22 the track on the curve in question was forced out of normal alinement about 6 inches when engine 4526 was proceeding westward over it at a speed of about 25 miles per hour. On September 2 the track on a 6° curve about 17 miles east of Avenstoke was forced out of normal alinement by engine 4526. Mechanical forces who examined this engine in each instance reported they they were unable to find any condition that would cause the engine to force the track out of normal alinement. Soon after the accident, while the engine was still lying on its left side, two machinists in the service of the carrier found the left intermediate driving box without lubrication and stuck to the shoe and the wedge.

The surface, alinement and gage of the track on the curve were well maintained for the maximum authorized speed of 40 miles per hour. Extra 4526 was rounding the curve at approximately equilibrium speed, and therefore no lateral force would be exerted against the high rail. However, the manner in which the high rail was forced outward indicated that a considerable force had been exerted against it. Apparently this would be caused either by excessive rigidity of the wheelbase of the engine or by an abnormal distribution of the spring-borne weight. No defective condition of the engine truck or the trailer truck was found, and the investigation disclosed no improper adjustment of the chafing casting between the engine and the tender. Evidently, when the derailment occurred the left No. 2 driving wheel was carrying considerably more than its specified portion of the spring-borne weight, and the right No. 1 driving wheel was carrying considerably less than its portion, and it is believed that this condition was caused by the left No. 2 driving box being stuck. Under these conditions, when the engine thrust toward the low side of the curve after it had first thrust outward, the lack of normal weight on the right No. 1 driving wheel permitted this wheel to pass over the head of the low rail.

Cause

It is found that this accident was probably caused by improper distribution of the spring-borne weight of the locomotive.

Dated at Washington, D. C., this twentieth day of November, 1944.

By the Commission, Chairman Patterson.

W. P. BARTEL,
Secretary.

(SEAL)