INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE

LOUISVILLE & NASHVILLE RAILROAD

HOPKINSVILLE, KY.

DECEMBER 24, 1937.

INVESTIGATION NO. 2237

SUMMARY

Inv-2237

Railroad:	Louisville & Nashville	
Date:	December 24, 1937.	
Location:	Hopkinsville, Ky.	
Kind of accident:	Rear-end collision	
Trains involved:	Passenger	: Passenger
Train numbers:	First 54	: Second 54
Engine numbers:	271	: 410
Consist:	8 cars	: 12 cars
Speed:	Standing	: 30 m.p.h.
Track:	Tangent	
Signals:	Automatic Block System	
Weather:	Misty	
Time:	9:51 p.m.	
Casualties:	44 injured	
Cause:	Closed angle cock at the rear of the second car.	

January 24, 1938.

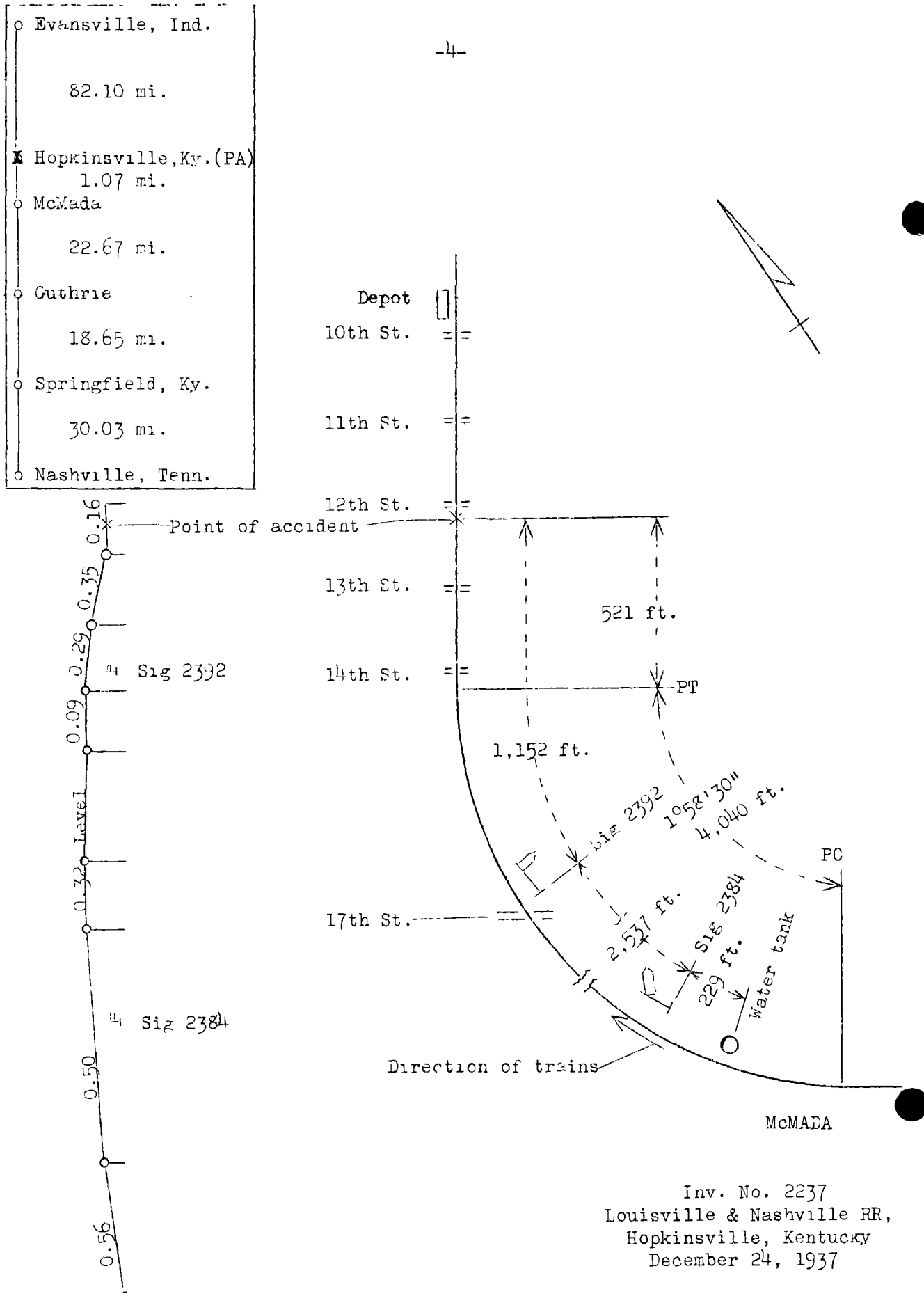
To the Commission:

On December 24, 1937, there was a rear-end collision between two passenger trains on the Louisville & Nashville Railroad at Hopkinsville, Ky., which resulted in the injury of 26 passengers, 7 railway mail clerks, 1 express messenger, 4 Pullman porters, and 6 railroad employees.

Location and method of operation

This accident occurred on that part of the Evansville Division which extends between Nashville, Tenn., and Evansville, Ind., a distance of 154.52 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. The accident occurred on the main track 468 feet south of the passenger depot at Hopkinsville. Approaching this point from the south the track is tangent for several miles, then there is a 1°58'30" right curve 4,040 feet in length, followed by a tangent which extends 521 feet to the point of accident and a considerable distance beyond. Starting 6,482 feet south of the point of accident the grade northward is ascending for 3,840 feet, varying from 0.31 to 0.56 percent, practically level for 1,360 feet, descending for 1,000 feet, varying from 0.29 to 0.35 percent, then 0.16 percent ascending for 282 feet to the point of accident and for some distance beyond.

Automatic block signals 2384 and 2392 governing northward movements are of the 3-position, upper-quadrant, semaphore type, approach lighted, and are located 3,689 and 1,152 feet, respectively, south of the point of accident. From the engineman's side of a northbound engine, there is an unobstructed view of signal 2384 to the right of the water tank at McMada between points 2,701 feet and 1,528 feet south of the signal; it is then obscured by the water tank until a point 412 feet south of the signal is reached when it becomes visible to the left of the tank. While this signal is visible to the right of the water tank the night indication is not good from that position because the focus of the light is across the curve and to the west. Signal 2392 becomes visible across the curve at a point 623 feet south of the signal. Night indications are red for stop, then proceed; yellow for approach, prepare to stop at next signal, train exceeding medium speed must at once reduce to that speed, and green for clear, proceed; medium speed is defined as one-half maximum authorized speed at point involved, not exceeding 30 miles per hour.



Inv. No. 2237
Louisville & Nashville RR,
Hopkinsville, Kentucky
December 24, 1937

Maximum speed limit for passenger trains in this territory is 70 miles per hour, and for trains handled by locomotives of the Class L-1 type, such as was involved in this accident, it is 60 miles per hour. Owing to heavy business during the holiday period, through passenger trains were temporarily operated in two sections, the first section carrying passengers and the second section carrying mail and express.

It was dark, cloudy and misty at the time of the accident, which occurred about 9:51 p.m.

Description

First 54, a north-bound passenger train, consisted of 1 combination baggage-passenger car, 3 coaches, and 4 sleeping cars, in the order named, all of all-steel construction, hauled by engine 271, and was in charge of Conductor Hackney and Engineman Gordon. This train left Nashville at 8 p.m., according to the train sheet, on time, made several stops en route and arrived at Hopkinsville at 9:48 p.m. After standing at this point about 2 minutes the rear end was struck by Second 54.

Second 54 consisted of 4 express-refrigerator cars, 7 mail and express cars and one coach, hauled by engine 410. Cars 1 to 5, inclusive, and 12 were of steel-underframe construction with wooden superstructures, the other cars being of all-steel construction. Engine 410 is of the 4-8-2 type. The weight of the engine loaded is 334,240 pounds, and of the tender loaded 202,000 pounds, total 536,240 pounds. The drivers are braked for 60 percent of their weight, the trailer for 45 percent of its weight, and the tender for 70 percent of its light weight. The engine truck is not braked. The total tonnage of Second 54 was approximately 800 tons. This train, in charge of Conductor Lane and Engineman Harris, left Nashville at 8:05 p.m., 5 minutes behind the first section, stopped at Springfield, 30.03 miles from Nashville, and also at Guthrie, 18.65 miles farther north, where coal and water were taken. It left Guthrie, the last open office, 23.74 miles south of Hopkinsville, at 9:25 p.m., according to the train sheet, 7 minutes behind First 54, passed signal 2384 displaying a yellow or approach indication, passed signal 2392 displaying a red or stop; then proceed indication, and collided with the first section while traveling at a speed estimated at about 30 miles per hour.

The force of the impact drove the rear portion of First 54 ahead about 50 feet. The first car in First 54 was driven into the tank of engine 271, telescoping the tank to some extent and puncturing a hole in it; five cars in First 54 were damaged. Two pairs of wheels on the eighth car were derailed.

Engine 410 stopped 57 feet north of the point of impact, having telescoped the vestibule of the rear car. The front end of the engine was damaged, all driving-wheel tires were flattened, the rear of the tender was mashed in, and the south tender truck derailed. The coupling between the tender and first car was broken. The first car was destroyed and three other cars were damaged. The employees injured were the engineman, the fireman, the baggageman, the flagman, and the train porter of Second 54, and the baggageman of First 54.

Summary of evidence

According to statements of members of the crew of First 54, that train had been standing at the station at Hopkinsville about two minutes when the collision occurred, and none of them except Flagman Hollingsworth was aware of anything wrong prior to the accident. Engineman Gordon stated that his train was standing with all brakes released except on the engine and tender. Although after the accident he was told that a closed angle cock had been found in Second 54 he did not go back to investigate. He understood that when approaching a signal displaying a caution indication he was required to reduce the speed of his train to medium speed and in no instance pass the signal displaying that indication at a speed in excess of 30 miles per hour; he stated that he complies with this requirement.

Flagman Hollingsworth of First 54 stated that he had seen the headlight of the second section at various points en route, and that he got off from the rear end of his train as soon as it stopped at Hopkinsville. He saw the headlight of the following train coming around the curve and he got back about 4 car lengths when the engine passed him. Fire was flying from the wheels of the engine and first two cars but he did not see any farther back.

Engineman Harris, of Second 54, stated that a terminal air-brake test was made at Nashville and the brakes were reported to him as all right; in making a running test shortly after leaving the station at Nashville the brakes functioned properly, and this was also the case in all slow-downs and stops en route, including those made at Guthrie, the last point where the brakes were used prior to approaching the point of accident. Between Nashville and Guthrie, because several signal indications changed from yellow to green ahead of his train, he knew that the first section was only a short distance ahead. The signal at the south end of Guthrie yard was yellow and he permitted his train to drift to the coal chute where he stopped and took coal. As the next signal was red, he stopped and then pulled on down behind First 54; as he did so he acknowledged stop signals given by the

flagman of that train. He then proceeded to the railroad crossing and stopped, following which he continued on to the north water crane where he made a spot stop to take water. He called in his flagman after First 54 had departed from Guthrie, and after receiving a proceed signal from the rear of his train he departed at 9:25 p.m. Leaving that point the gauge registered 90-pounds brake-pipe pressure and 120-pounds main-reservoir pressure. Clear signal indications were received all the way to the north switch at McMada, 22.67 miles north of Guthrie, although when about 1 or 1¼ miles from one signal south of McMada he saw that signal indication change from yellow to green. Approaching signal 2384 the speed of his train was about 60 miles per hour, and as that signal was displaying a yellow indication he started to make a service air-brake application at a point just south of the water tank which is located 229 feet south of the signal. The brakes, however, did not respond properly; consequently he immediately moved the brake valve to emergency position, when about opposite the signal, and left it there. Just at that time the fireman reminded him that First 54 was likely to be around the curve, and he called the fireman's attention to the fact that the brakes were not functioning properly. By the time the red indication displayed by signal 2392 came into view he realized that a collision was inevitable and warned the fireman accordingly; both decided to remain on the engine, and did so. At about that time he reversed the engine and although the sanders were open the driving wheels skidded on the wet rail. He sounded distress signals with the engine whistle and continued to do so until the collision occurred; he estimated the speed at that time to have been about 30 miles per hour. He stated that he had not observed any trespassers on or near his train at any point en route. He did not have any occasion to use the air brakes between Guthrie and the point where he first applied them after noting the indication of signal 2384 and had no intimation that anything was wrong with the brake system until that time. In applying the brakes south of signal 2384 he had in mind stopping for signal 2392. About 10 or 15 minutes after the accident, the fireman suggested that they go back along the train and endeavor to locate the trouble. The fireman, carrying a lighted white lantern, led the way back, and he, still somewhat dazed, followed about one-half car length behind. When they reached the rear end of the second car they discovered that the angle cock on the rear or south end of that car was completely closed. About one-half hour after this discovery he asked Conductor Lane to go back and look at the closed angle cock, but he did not know whether the conductor actually went back.

The statement of Fireman Faith, of Second 54, a promoted engineman, agreed with that of Engineman Harris. He also said the engineman was normal in every respect. Four stops were made at Guthrie, the first stop being made to take coal, the second

in obedience to the red indication of a signal, the third for a railroad crossing, and the fourth to take water. First 54 was leaving Guthrie when the second stop was made. It was about 12 or 15 minutes after the accident when he and the engineman found the closed angle cock on the rear end of the second car; he did not touch the angle cock or go in between the cars, but merely held his lighted white lantern in between the cars. No burning fusee was encountered between McMada and Hopkinsville, nor was any torpedo exploded. At Hopkinsville the flagman of First 54 was about 50 or 60 feet behind the standing train, giving stop signals with a red lantern, and after the accident he went forward toward his own train. The bell was ringing on his engine and the whistle was sounded from 17th Street until the collision occurred.

Conductor Lane, Baggageman Harris and Flagman Hale, of Second 54, were in the coach at the rear of the train. The conductor said that the air brakes had been tested, and that they worked properly en route. Second 54 stopped behind First 54 at Guthrie; when the first section departed from the platform the second section pulled ahead, stopped for the railroad crossing and again at the water crane; the delay at this point consumed 7 minutes. There was no air-brake gauge in the coach and he had no way of telling what air pressures were being carried. Approaching McMada the speed was about 60 miles per hour, and about 30 miles per hour when the coach passed 17th Street, and almost immediately thereafter and without any warning the crash occurred. It appeared to him that when the train passed 17th Street it was moving at about the usual speed made by passenger trains when preparing to make a station stop. Within an hour or so after the accident, at the request of the engineman, he went alone to the rear end of the second car and observed that the angle cock was closed. No trespassers were observed at any point en route. He stated that it is the general custom to be prepared to stop short of a red signal but very little attention is paid to the 30 mile speed limit passing the yellow signal. The flagman went back to flag immediately after the accident and neither the baggageman nor the flagman inspected the equipment after the accident.

Yard Fireman Wilkins, stationed at Hopkinsville, arrived at the scene of the accident about ½ hour after its occurrence. On reaching a point near the rear of the second car in Second 54 he met Engineman Harris of that train and Flagman Hollingsworth of First 54. Engineman Harris told him that the air brakes did not work properly, and then showed him the angle cock turned crosswise of the train-line pipe on the rear of the second car. Fireman Wilkins personally observed the closed angle cock, and Engineman Harris then called to Flagman Hollingsworth and pointed

cut the closed angle cock. Engineman Harris was in a dazed condition at the time.

Statements of various other employees developed no additional information of importance, and it could not be determined how the angle cock on the rear end of the second car, which was of the self-locking type, became closed prior to the accident. Several instances were mentioned in which angle cocks had been found closed in trains en route.

Signal Engineer Williams stated that it would not be expensive to extend control of signal 2384 to the station platform at Hopkinsville, but because of yard engine switching on the main track for almost one entire 8-hour period daily it would seriously delay freight trains by requiring them to stop at signal 2384 and again at signal 2392.

Roundhouse Foreman Kennon stated that after the accident there were flat spots from 2 to 2¾ inches long on the driving wheel tires of engine 410.

On December 29, tests were made using a train made up of equipment similar to that composing Second 54, under conditions practically identical with those which existed at the time of the accident. Engineman Harris handled the engine and attempted to duplicate the procedure followed by him on Second 54 as he approached Hopkinsville just prior to the collision. Four tests were made; in the first test the train with all brakes operative was stopped from a speed of 60 miles per hour in 2,308 feet, using a full service application. The three remaining tests were made with the brakes operative on only the engine, the tender and the two head cars. Under these conditions, from a speed of 40 miles per hour the train was stopped in 1,488 feet; from 50 miles per hour the stop was made in 3,669 feet, and from 61 miles per hour in 5,269 feet. In the last-mentioned test the train was moving at a speed of 38 miles per hour when the point of collision was passed, and it continued beyond that point a distance of approximately 1,200 feet.

Discussion

Prior to leaving Nashville the air brakes on Second 54 were given the usual test; they functioned properly during this test and also when making the running test on departing from that point, as well as when making various slow-downs and stops between Nashville and Guthrie, 48.68 miles distant. At Guthrie, Second 54 made four separate stops, viz., 1, to take coal; 2, in obedience to the stop indication of a signal, with First 54 occupying the track ahead; 3, for a railroad crossing, and 4, to take water.

The record indicates that First 54 was leaving Guthrie when Second 54 made the second of these stops. Had the angle cock at the rear end of the second car been closed at that time the engineman and fireman would no doubt have detected the fact that braking power was not available throughout the train because of the distance required to stop and the duration of the brake pipe exhaust. No trespassers were observed on or about the train at any point. Second 54 departed from Guthrie 7 minutes behind First 54. After leaving Guthrie there was no occasion for using the brakes until a yellow signal indication was received at signal 2384, about 23 miles farther north. At that time the speed of Second 54 was about 60 miles per hour, and at a point about 400 feet south of signal 2384 the engineman made a service brake application, but the brakes did not respond properly, and there was only a short brake pipe exhaust. The engineman immediately moved the brake valve to emergency position and left it there. At about 17th Street, 1,186 feet south of the point of accident, the engineman reversed the engine, and although the sanders were open the engine wheels skidded on the wet rail. The engineman also sounded distress signals on the whistle, and continued to do so until the collision occurred, at which time he estimated the speed to have been about 30 miles per hour. After the accident the fireman, engineman and conductor of Second 54, also a yard fireman at Hopkinsville, observed that the angle cock on the rear end of the second car was completely closed, but it could not be determined by whom or when it was closed.

The investigation disclosed that because of the curve and the location of a water tank a good view of signal 2384 cannot be obtained until a point only 412 feet south of that signal is reached; also, the distance between signals 2384 and 2392 is only 2,537 feet. The location of signal 2384 should be changed to provide a better opportunity for enginemen to observe its indications and to provide increased stopping distance. There was some evidence in this investigation to the effect that the requirement that a train receiving an approach indication must at once reduce to medium speed was not being properly complied with, and this question should promptly be given necessary attention by the officers of this railroad company.

Conclusion

This accident was caused by failure properly to control speed due to a closed angle cock at the rear end of the second car of a twelve-car train.

Respectfully submitted,

W. J. PATTERSON,
Director.