

Inv-2069

INTERSTATE COMMERCE COMMISSION
WASHINGTON

REPORT OF THE DIRECTOR
BUREAU OF SAFETY

ACCIDENT ON THE
SOUTHERN RAILWAY

EFLAND, N. C.

JUNE 11, 1936

INVESTIGATION NO. 2069

SUMMARY

Railroad: Southern
Date: June 11, 1936
Location: Efland, N. C.
Kind of accident: Derailment
Train involved: Freight
Train number: 54
Engine number: 4875
Consist: 57 cars and caboose
Speed: 20-35 m.p.h.
Track: 3° curve, descending grade
Weather: Clear
Time: 2:25 p.m.
Casualties: 1 killed
Cause: Slack of freight train ran in and forced coal car from track on curve while on descending grade.

To the Commission:

On June 11, 1936, there was a derailment of a freight train on the Southern Railway near Efland, N. C., which resulted in the death of one trespasser.

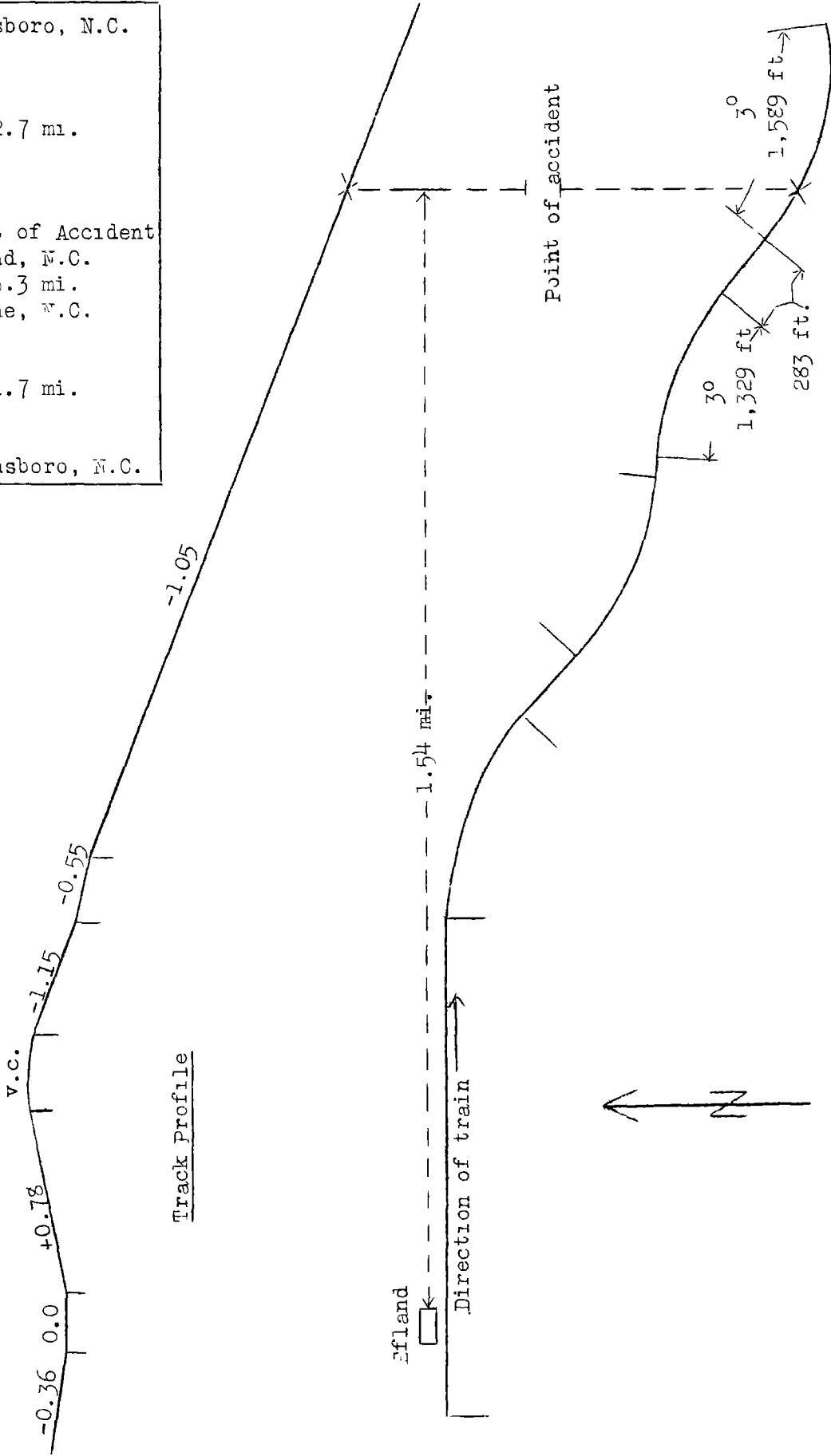
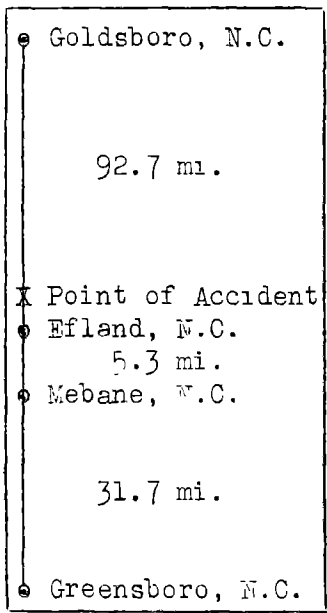
Location and method of operation

This accident occurred on that part of the Danville Division extending between Greensboro and Goldsboro, N. C., a distance of 129.7 miles; in the vicinity of the point of accident this is a single-track line over which trains are operated by time table and train orders, no block-signal system being in use. The accident occurred at a point 1.54 miles east of the station at Efland; approaching this point from the West, there is a 3° curve to the right 1,329 feet in length and 283 feet of tangent, followed by a 3° curve to the left 1,589 feet in length, the accident occurring on this last-mentioned curve at a point 396 feet from its western end. Starting at a point about 700 feet east of Efland station, the grade eastward is ascending at the rate of 0.78 percent for a distance of about 1,500 feet, and then it is descending for a distance of approximately 6,000 feet to the point of accident and for a considerable distance beyond that point, this gradient varying from 0.55 to 1.17 percent and being 1.05 percent at the point of accident.

The track is laid with 85-pound rails, 33 feet in length, with an average of 20 hardwood ties to the rail length, fully tieplated, single-spiked, and ballasted with stone and chats to a depth of about 8 inches below the bottoms of the ties; the track is well maintained. The maximum super-elevation of the outside rail of the curve involved was 3-7/8 inches, and it was 3-3/8 inches at the point of derailment; the gauge was practically uniform, varying only slightly from 4 feet 8-5/8 inches.

Under the rules, the speed of trains is restricted to the minimum time between stations as shown in the time table; Hillsboro is located 3.9 miles east of Efland and the minimum time listed for freight trains between these points is 6 minutes, providing for an average speed of 39.6 miles per hour.

The weather was clear at the time of the accident, which occurred about 2:25 p.m.



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Description

Train No. 54, an eastbound freight train, consisted of 52 loaded and 5 empty cars and a caboose, hauled by engine 4875, and was in charge of Conductor Fowler and Engineman Stratford. This train left Mebane, the last open office, 5.3 miles west of Efland, at 2:08 p.m., 2 hours 5 minutes late, and was derailed while descending the grade just east of Efland at a speed estimated to have been between 20 and 35 miles per hour.

The engine and first six cars were not derailed and continued about 10 or 15 car lengths before stopping. The lead pair of wheels of the front truck of the seventh car, Norfolk & Western hopper 72411, was derailed to the right and straddled the south rail for a distance of 54 feet, beyond which point the track was practically demolished for a distance of 430 feet; this car stopped on its right side 648 feet east of the initial point of derailment, south of the track, with the front truck near its original location under the car; the next car was a short distance behind it and upright. Approximately 75 feet west of these cars there were two cars that stopped on their sides north of the track and behind them 16 cars were piled in a heap on and near the roadbed, while the next two cars were derailed but remained upright; 14 of the derailed cars were destroyed.

Summary of evidence

Engineman Stratford stated that when about $\frac{3}{4}$ mile west of Efland he reduced speed to about 15 miles per hour, in compliance with a caution signal given by a section man; after passing the territory where the track work was in progress, he released the brakes and opened the throttle enough to keep the train stretched and negotiate the ascending grade located just east of Efland. When the engine tipped over the top of the hill the speed was about 15 miles per hour and on starting down the grade he moved the throttle to the usual drifting position and the first intimation he had of anything wrong was on feeling an uneven movement of the engine, a lurch backward and then forward, at which time the speed was about 25 or 30 miles per hour, and the air brakes were applied in emergency from the rear and the brake pipe gauge went almost to zero. Engineman Stratford said that he was not working enough steam to keep the slack stretched all of the time while descending the grade, and that he did not apply the air brakes. There was nothing wrong with track conditions and the engine

rode smoothly and he did not notice any unusual slack run-in or movement of the cars in the train prior to the accident, and neither could he tell whether the lurch that occurred on the engine was caused by slack action or the cars being derailed. Engineman Stratford had worked in this territory for many years and he said it was the usual practice while descending a grade similar to the one involved to keep the driving wheel brakes released in order to keep the slack stretched; he also said that there were a number of dips and rises encountered while descending these grades and that it was common occurrence to get a slack run-in, and with a train of this length the slack ordinarily would become bunched somewhere in the vicinity of where the derailment occurred. Statements of Fireman Parks and Brakeman Jarrell, the latter riding in the cabin on the tender, were similar to those of Engineman Stratford.

Conductor Fowler and Flagman Owen, who were in the caboose cupola at the time of the accident, said there was no unusual movement or rocking of the cars in the train, and that the engine was drifting and the brakes released while descending the grade. No air-brake application was made prior to the derailment, and the first indication of anything wrong was when the caboose gauge went to zero; the slack ran in and the caboose surged several times and then stopped after traveling about 20 or 25 car lengths. There was no run-in of slack prior to the accident on this particular occasion, however, they said that during their many years of service it had been customary to use the air brakes while descending this grade and that a run-in of slack usually was experienced in this vicinity due to the use of the brakes; in this particular case, with the brakes having been used previously, the conductor thought the slack would have run in just about the time the derailment occurred. These witnesses estimated the speed to have been between 25 and 35 miles per hour when the derailment occurred, and the flagman said that the lurch of the caboose, the application of the brakes, and the run-in of slack all occurred at about the same time.

General Car Foreman Fulk, who arrived at the scene about 5 p.m., said that on inspecting the track he saw the flange marks of one pair of wheels on top of the south or high rail of the curve and this mark also showed plainly on the ties, leading immediately off the ends of the ties. He ascertained that these marks were made by the front pair of wheels in the lead truck at the east or B-end of hopper 72411, loaded with coal, which was the first car to be derailed; this car was lying on its side with the damaged lead truck against the underframe, while the truck at the west or A-end was undamaged. He examined

the body side bearings of the car, the lead truck and its wheels, but found nothing to indicate that this truck or its wheels contributed to the derailment. The flanges were in good condition, the body side bearings had an unusually wide and smooth surface, and apparently there were no bent axles, although he did not gauge them. The truck side bearings had been displaced from their pockets and lost in the wreckage. There was a fracture in the top or compression member of the cast-steel truck side frame at the L-1 location, and its journal boxes were badly twisted and the tie straps broken loose; however, this break apparently occurred after the derailment, as the fracture was new and the bottom or tension member was not broken, which probably would have been the case had the truck side failed; furthermore, the side frame and parts on that side showed scars and shear marks, evidently caused by contact with the rail after derailment. He did not find any marks of dragging equipment, nor did he see anything wrong with track conditions, and in his opinion the accident was caused by the slack running in as the train was descending the grade, which set up a rocking motion in the car, resulting in the flange of the lead wheel on the south side being lifted sufficiently to permit it to drop on top of the rail, thereby precipitating the derailment.

Chief Engineer Sitton, Maintenance of Way and Structures, stated that a car is caused to rock off the track either by rough track or improper side-bearing clearance, or both, and that measurements of the track disclosed no condition that would have caused the car to rock off, and he considered the track at this point safe for a speed of 60 miles per hour. He also said it was evident from the wheel marks on the rail and ties leading sharply away from the tangent line of the curve, that the hopper car involved had not rocked off the track, but was thrown off by some force acting toward the outside of the curve.

Car Inspector Stout had inspected the cars picked up by Train No. 54 at Greensboro, N. C., among which were hopper 72411; he did not take any exception to the condition of this car, and he said that he always closely inspected high side and heavily loaded cars.

Section Foreman Sisk stated that the track involved did not present any unusual maintenance problem; it was last surfaced in the summer or fall of 1935, and he had walked over it on June 6, the only repairs necessary being at a joint several rail lengths east of where the derailment occurred.

Roadmaster Anderson stated that there was no indication of dragging equipment, and there was nothing about track conditions that would have contributed to the accident. It was his experience that when a car rocked off the track the ties would be marked differently than on this occasion, in that the wheel would follow around the curve, whereas in this instance the flange marks were at an angle which indicated that they were forced off the track. In his opinion the derailment was caused by a slack run-in, which bunched the cars, caused this wheel to mount the rail and forced it off the track. Track Supervisor Bookout also was of the opinion that the accident was caused by the slack running in with such force that it lifted the car and derailed it.

Inspection of the track by the Commission's inspectors in company with officials of the railway, failed to disclose any condition that would have caused or contributed to the accident, and there was no indication of dragging equipment. Inspection of hopper 72411 showed it to be a high side, all-steel, hopper coal car, built in December, 1934; length over center sills to face of striking casting, 31 feet 7 inches; light weight, 43,100 pounds; capacity, 115,000 pounds; load limit, 125,900 pounds. The car is equipped with Andrews cast-steel truck sides and a cast-steel truck bolster with plain block side bearings, and 33-inch wrought steel wheels. At the time of derailment this car contained 119,500 pounds of coal; gross weight of car and contents, 162,600 pounds. At the L-1 location, the side had a complete fracture in the top or compression member at a point 21 inches back of the front box bolt; the tension member was not broken, but both journal boxes on this side were badly twisted and the tie straps were broken off, while the rivets and frame showed shearing action, evidently from contact with the rail after derailment. The truck-bolster center-plate casting was lightly polished, indicating normal and uniform wear. The truck side bearings consisted of oval pockets, $10\frac{1}{2}$ inches in length, $2\frac{3}{4}$ inches wide, and 2 inches deep, which contained flat metal bearings, unsecured; the bearing plates were lost out in the derailment and could not be found, but the bottoms of the pockets showed evidence of recent uniform contact with the plates. The body bearings also were smooth and showed no abnormal condition. The wheel at the L-1 location, which was the first to be derailed, showed a full flange contour and $\frac{7}{16}$ inch service metal on the tread; the opposite or north wheel showed the flange contour to be good and the axle was true; there was no indication that the truck or wheels contributed to the accident.

Discussion

The evidence developed in the investigation of this accident showed that Norfolk & Western hopper 72411, loaded with coal, was the first car to be derailed. Careful examination of this car did not develop any defective condition which could have contributed to its derailment, neither was there anything wrong with the track or any indication of excessive speed. On the other hand, however, the marks made on the track by the derailed lead truck of the car in question indicated that the car was derailed and forced off by some force moving toward the outside of the curve. It also appeared that the brakes had been applied west of the station and that then they were released and steam worked to some extent on the ascending grade east of the station, stretching the slack, following which the engineman shut off to a drifting throttle on the descending grade without making any application of the brakes. It was the idea of the engineman and also the conductor that the slack would run in about the point where the accident occurred, and it is believed that this is what actually occurred, and that the derailment was due to the run-in of slack on the descending grade.

The occurrence of this accident serves again to call attention to the need for the various railroads of the country to give close consideration to the proper maintenance of draft gear and the elimination of excessive slack. In some cases this subject is being handled more or less actively, but on the other hand some of our investigations have developed instances where little or no attention is being paid to this matter, even though the Association of American Railroads has adopted certain rules as recommended practice and published the same in circular form. One of these rules, for example, provides in substance that the draft gear will be examined when cars are on repair tracks undergoing periodic cleaning of air brakes, and, if the slack exceeds $1\frac{1}{2}$ inches, repairs are to be made or parts renewed, and yet in one of our investigations on another railroad, involving an accident in which free slack was an important factor, it was found that the two cars involved had undergone periodic air cleaning 8 and 42 days prior to the date of the accident, with no repairs to the draft gear on either car, although the free slack on both ends of each car was in excess of $1\frac{1}{2}$ inches; it also appeared in that particular case that at one major repair point the air cleaning was done while the cars were coupled in the yard, making it impossible to determine the condition of the draft gears with respect to slack action, as contemplated by the recommended practice. In connection with some of our safety appliance inspection work, free slack was found which measured all the way up to 4 inches.

The existence of conditions as above outlined does not indicate that some of the railroads are taking very seriously the practice recommended by the Association of American Railroads and the occurrence of the accident here under investigation serves the purpose of again emphasizing the importance of the subject, and of the need for every railroad to take energetic measures to carry out the recommended practice.

Conclusion

This accident was caused by a run-in of slack.

Recommendation

It is recommended that the Association of American Railroads adopt as standard the present recommended practice with respect to inspection and maintenance of draft gears and attachments, with suitable penalty for noncompliance.

Respectfully submitted,

W. J. PATTERSON,

Director.