

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN
RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED
ON THE TEXAS AND NEW ORLEANS RAILROAD, SOUTHERN
PACIFIC LINES, NEAR URBANA, TEXAS, ON JULY 20,
1930.

August 25, 1930.

To the Commission:

On July 20, 1930, there was a derailment of a freight train on the Texas and New Orleans Railroad, Southern Pacific Lines, near Urbana, Texas, which resulted in the death of one employee and the injury of two employees.

Location and method of operation

This accident occurred on the Lufkin Subdivision of the Beaumont Division extending between Houston and Lufkin, Texas, a distance of 118.9 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 1.72 miles east of the station at Urbana. Approaching the point of accident from the west the track is tangent for a distance of 4.2 miles, followed by a 2° curve to the left 1,807.5 feet in length, the accident occurring on this curve at a point 847.2 feet from its western end. The grade is slightly descending for eastbound trains.

The track is laid with 75-pound rails, 33 feet in length, with an average of 18 creosoted pine ties to the rail length, fully tie-plated on curves and 65 per cent tie-plated on tangent track, and single spiked. The track is ballasted with burnt gumbo to a depth of from 10 to 34 inches, and is well maintained, at the point of accident the track was on a fill approximately 10 feet in height. The speed of trains in the vicinity of the point of accident is restricted by a slow-board, passenger trains to 35 miles per hour and freight trains to 18 miles per hour, these restrictions having been in effect since May, 1929, due to a washout at that time.

The weather was clear at the time of the accident, which occurred at 6.50 p.m.

Description

Eastbound freight train extra 390, consisting of 46 freight cars and a caboose, hauled by GH&SA engine 990, was in charge of Conductor Page and Engineman King. This train left Humble, 42.8 miles west of Urbana, at 5.05 p. m., according to the train sheet, and was derailed while traveling at a speed estimated by members of the train crew to have been between 18 and 20 miles per hour.

The engine, tender, the first 14 cars and the front truck of the 15th car were derailed, the engine coming to rest on its left side to the left of and parallel with the track, its front end being approximately 1,000 feet east of a private road crossing where apparently the engine truck first became derailed. The tender remained coupled to the engine and was lying diagonally across the track. The first 14 cars were piled up at various angles on both sides of the track in a space of about 150 feet, 9 of these contained oil, and they all were destroyed by fire. None of the remaining equipment was derailed or damaged. The employee killed was the fireman.

Summary of evidence

Engineman King stated that approaching the curve on which the accident occurred he made a 15-pound brake-pipe reduction, reducing the speed of his train from approximately 30 miles per hour to 20 miles per hour. He then released the brakes. Just as he was entering the curve he heard something snap and a screeching noise made by the wheels, the fireman looked out and told him something was dragging and plowing up the dirt. Engineman King applied the air brakes in emergency, then looked out of the cab window himself and saw dirt and ballast flying out from under the engine. He did not know whether or not the engine had run over something, the first thing he thought was that the front spring had broken and allowed the pilot and front end to drop down. He later stated that he was quite sure the engine did not strike anything. Engineman King did not think that the engine traveled more than 200 feet after the emergency application, although the air brake system had not had time to fully recharge after he had made the service application. After the derailment the engine had practically come to a stop when slack ran in and caused it to turn over. The air brakes had been tested and were in good condition. He oiled and inspected the engine at Milledge water tank, his last stop, and did not find any defects. Prior to the time of the accident the train had ridden smoothly.

Head Brakeman Swaggerty stated that after leaving Milledge he was riding on the right side of the third car, he felt the train reduce speed approaching the curve on which the accident occurred and he thought it was traveling at a speed of about 20 miles per hour when he saw dust fly from the head end of the engine; he then noticed a man riding in an automobile along the highway who pointed toward the train and when he looked ahead again he saw gumbo flying from near the front trucks of the engine. He saw the engine turn over first, followed by the first two cars, and he then jumped toward the south side of the track. Brakeman Swaggerty further stated that he inspected the front portion of the train while at Milledge and he saw the engineman oil the engine.

The statements of Conductor Page, who was riding in the caboose, brought out nothing additional of importance except that he estimated the speed of the train at the time of the accident to have been 18 miles per hour, and after the derailment he said that Engineman King told him he thought the derailment was caused by either a spring breaking under the engine or by gravel on the track.

Rear Brakeman Baker stated that he was riding on the left side of the cupola approaching the curve on which the accident occurred and was watching the track ahead as the train rounded the curve when he saw a big cloud of dust at the head end of the train. Realizing that something was wrong he opened the conductor's valve, however, at about the same time he thought the engineman applied the air brakes in emergency, and in a very short time the head end of the train was obscured by smoke and dust. He stated that when he first saw the cloud of dust near the engine he did not think it was more than 40 or 50 feet from where the engine turned over, and that the train was not exceeding a speed of 20 miles per hour at the time of the accident.

Section Foreman Summers, who has charge of the section on which the accident occurred, stated that he went to the scene of the accident a short time after its occurrence, but he did not make an inspection of the track until the following morning, at which time he found a few low joints on the inside of the curve and the elevation from $\frac{1}{4}$ to $\frac{1}{2}$ inch high in some places, the gauge was good. The first marks on the track he noticed were at a private road crossing, 12 inches from the gauge side of the north rail and appeared to be made by something dragging. Section Foreman Summers further stated that he had lowered and resurfaced some of the track in the vicinity of the point of accident on July 9th or 10th and had made an inspection of that portion of the track on July 18th.

Assistant Superintendent Bell stated that he arrived at the scene of the accident several hours after its occurrence. He examined the engine and found the throttle slightly open and reverse lever slightly forward of center, the brake rigging was badly bent and some of it broken off as if the engine had run over some heavy object in center of the track. The front truck wheels were off the engine and were found the next day under the wreckage at a point about 140 feet west of the front end of the engine, on the south side of the track, and the center casting was 15 feet west of the wheels. The radius bar was broken through the rear bolt holes of the pedestal braces. There was a hole about 4 feet in depth in center of track, about 15 feet from the east end of the car remaining on the track, the 15th car in the train. Examination of the track west of the point where the cars were overturned showed marks on the ties about 9 inches from the gauge side of the north rail; there was a heavy mark approximately 5 inches in width on about every third tie, the bolts on each rail joint on inside of the north rail were marked westward to a road crossing for a distance of about 750 feet. There was a mark in the ballast through the entire width of this crossing about 4 inches in depth and from 8 to 12 inches in width, this mark was 9 inches from the gauge side of the north rail, these marks were new and indicated that something had been dragging.

Division Engineer Boyer stated that he arrived at the scene of the accident with Assistant Superintendent Bell and he corroborated his statements as to conditions found. The track conditions preceding the point of derailment were in no way responsible for the derailment. Superelevation of curve, gauge and alignment were checked and found to be in good condition for speed in excess of that permitted at that point. The slow board was placed primarily to protect the track a few hundred feet east of the point of derailment and during periods of wet weather.

Chief Assistant Superintendent Motive Power and Equipment Brown stated that the engine truck was practically destroyed in the derailment but that all principal parts were located except the forward or "Y" section of the radius bar, which was broken off through the rear pedestal brace bolt holes, the cross section at point of break being $1 \frac{3}{16}$ inches x $6 \frac{29}{32}$ inches. This break showed progressive fractures, there being four on top and three from bottom of bar, the remaining section of good metal being approximately 2 square inches. The rear portion of the radius bar which remained on engine showed that after break occurred the broken sections did not again come in contact with each other.

The long equalizer to engine truck had marks on left side and one bolt had been sneared off underneath engine frame at front end of cylinder saddle. The back side of right end of bumper beam center casting was also marked, these marks indicate that engine truck wheels turned under engine. One wheel, presumably the left one, shows mark entirely around the rim; one heavy mark was across the rim from flange side outward and there were several marks on the flange of this wheel. The opposite engine truck wheel, presumably the right one, had sliding marks across the flange and tread. No marks were found on rails in vicinity of derailment which would indicate rim of left wheel was in contact with inside of north rail or that the tread and flange of right wheel was sliding on the south rail.

Special Agent Carroll stated that on the day after the occurrence of the accident he talked to two negro men, Messrs. Johnson and Harrison, who said they were passing along the highway in a wagon, westbound, on the south side of the track and Mr. Harrison said that just before they got alongside of the head end of the train he noticed dust and gumbo flying and saw that the front engine truck was off the track. The wheel next to the highway, which would be on the enginemen's side was extending over the rail and the opposite wheel appeared to be under the front end of the engine. The wheels were not turning, but were being pushed along with the truck turned almost half around. He remarked to his companion that the train was going to wreck, and when it had moved about 25 steps farther, the front end of the engine appeared to rise about a foot and rocked from side to side and then turned over. He thought the train was traveling at a speed of at least 35 miles per hour when the derailment occurred.

Inspection of the track disclosed that the first mark was at a private road crossing, it being constructed of burnt gumbo and filled to within 1 inch of the level of the top of the rails. Throughout the width of this crossing a furrow about 4 inches in depth and 6 inches in width had been plowed in the ballast approximately 9 inches from gauge side of north rail. The threaded ends of two angle iron bolts of the joint at the east side of the crossing, on north rail, were lightly chafed. Either one or two bolts of nearly all of the joints on the north rail were likewise marked between the crossing and the point where the track was torn up. There was a mark on one tie on the inside of the north rail between the joints of the second rail and on five ties between the joints of the ninth rail east of the crossing and then these marks appeared on from three to all of the ties between joints of each rail to point where track was torn up. These marks ranged from 2 to 5 inches in width and were about 9 inches from the gauge side of the north rail.

At a point 768 feet east of the beginning of the first mark a similar mark appeared on a tie inside of the south rail and that mark continued on all the ties for a distance of 25 feet, where track was badly torn up for a distance of about 170 feet. All these marks apparently had been made by the slued engine truck wheels.

Engine 990 is of the 2-10-2 type, built in September, 1917, and has a total weight, engine and tender, loaded, of 526,460 pounds. The weight of engine is distributed as follows: engine truck 29,000 pounds, driving wheels 278,000 pounds, trailer truck 46,000 pounds. The Commission's records show that this engine last received annual inspection on May 18, 1930, at Houston, Texas, and monthly inspection on June 24, 1930, at which times the driving gear and running gear were reported to have been in good condition. Engine 990 was equipped with two-wheel engine truck with constant resistance type center casting. The main engine truck frame is one casting, the pedestal jaws being bolted in place, with radius bar bolted to lugs of engine truck frame near top of pedestals. Pedestal braces are fastened to lower end of rear engine truck pedestal jaws and bolted to underside of engine truck radius bar approximately 34" ahead of the connection of the radius bar to engine frames. Diameter of engine truck wheels is 31"

Inspection of the engine before it was moved from the wreckage disclosed that the radius bar of the engine truck was broken. There were marks on the left side of truck equalizer and back of pilot beam center casting, on right side, indicating that the engine truck wheels had slued, the left wheel backward and the right wheel forward. Inspection of the wheels after being brought to the Houston shops developed that one wheel had a mark on rim entirely around the wheel and the other wheel had sliding marks diagonally across the flange and tread.

A part of the radius bar involved remained attached to the engine and two pieces of it, the right pedestal brace and part of the left pedestal brace, were found in the wreckage, but part of the radius bar and part of the left pedestal brace were not located. The part remaining attached to the engine had failed at the rear bolt holes of the pedestal braces, which failure was due to seven progressive fractures, the part adjoining this piece has not been found. At the point of fracture the bar measured $1 \frac{3}{16}$ inches in thickness and $6 \frac{29}{32}$ inches in width. In addition to the required two bolt holes, which were in a line straight across the bar, there was an unnecessary hole with center about $\frac{1}{4}$ inch ahead of and $15/16$ inch to the left of the center of the required

hole on the left side of bar. The diameter of each of these three holes was $1 \frac{1}{16}$ inches. The combined areas of fractures, new breaks in metal, and bolt holes represented, respectively, about 24, 24 and 52 per cent of the cross sectional area of the bar. All the fractures appeared to have started at the outer surface of bar at bolt holes.

On July 24th, at Houston, Texas, a pair of wheels, 31 inches in diameter, similar to those on engine truck of engine 990, was placed on a track, laid with 80-pound rails, 5 inches in height, with one wheel on the rail and the opposite one off the rail, but held next to rail with flange touching tie. It was found that with a pair of wheels in this position moving along the track, the rim of the wheel inside of rail was in position to strike inside end of track bolts and the flange of this wheel was in position to mark gravel and ties approximately 10 inches from gauge side of rail.

Conclusions

This accident was caused by a broken engine truck radius bar.

The investigation developed that as the train entered the curve on which the accident occurred the engineman heard something snap and a screeching noise apparently made by the wheels. The marks on the track indicate that apparently the engine truck became derailed at the private road crossing and that the marks between that point and the point where the equipment came to rest were made by the slued engine truck wheels.

All of the employees involved were experienced men, and at the time of the accident none of them had been on duty in violation of any of the provisions of the hours of service law.

Respectfully submitted,

W. P. BORLAND,

Director.