

IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE -56
ST. LOUIS SOUTHWESTERN RAILWAY OF TEXAS, NEAR 73
SELBY, TEXAS, ON JUNE 18, 1918. -50

July 30, 1918.

On June 18, 1918, there was a derailment of a troop train on the St. Louis Southwestern Railway of Texas, near Selby, Texas, which resulted in the death of two soldiers and injuries to 32 soldiers, one civilian passenger and 3 train employees. After investigation the Chief of the Bureau of Safety reports as follows:

Sub-Division No. 1 of the Southern Division of this road, on which the accident occurred, extends from Waco, to Tyler, Tex., a distance of 130.2 miles. It is a single-track line, over which train movements are governed by timetable and train orders transmitted by telegraph, no block signals being used. Although the time-table designates the direction as north and south, the general direction is east and west. Northbound trains are superior by direction.

The train involved in this accident was troop train No. 284, running as extra 510 north, and consisted of locomotive 510, 14 passenger coaches, 6 freight cars and a caboose, in the order named, and was in charge of Conductor Bounds and Engineman Statham. It was enroute from Camp McArthur, Waco, Tex., to Anniston, Ala., via the St. Louis Southwestern Ry., Waco, Tex. to Corsicana, Tex. | This train left East Waco Yard at about 3.25 p.m., after receiving running order No. 44, reading as follows:

"Engine 510 will run extra East Maco to Corsicana with right over all trains south except first class but will wait at Mt. Calm until 4 p.m. for extra 453 south and not exceed 20 miles an hour."

At about 3.40 p.m., while running at a speed of about 20 miles per hour, the train was derailed at a point about 1.1 miles north of Selby.

Leaving Selby, the track is tangent and the grade practically level for a distance of 1,513 feet, then there is a descending grade of slightly less than 1% for a distance of 2,984 feet, followed by a 2°48' curve to the right on practically level track for a distance of 783 feet, then 555 feet of straight track to the point of derailment. The track at this point is laid on an 8-foot fill. One hundred and thirteen feet north of the point of derailment is Trestle No. 733, a 6 panel, 7 pile bent, wooden structure, 81 feet long and 12 feet, 6 inches in height from the center of ravine.

The locomotive and first five cars were derailed and, excepting the fifth car, came to rest on the left or west side of the track, but the rear fifteen cars of the train remained on the track and were in serviceable condition after the accident. The locomotive and tender frame remained coupled together and both came to rest at the bottom of the fill in an inverted position almost parallel with and not over 15 feet distant from the track, while the tender cistern was torn loose from its frame and lodged in an inverted position at right angles to the track and about 23 feet distant from it. The

front tender trucks were thrown down the embankment and jammed against the tender frame, while the rear trucks remained upright on the roadbed.

The first coach, which was of wooden construction, came to rest in an inverted position partly under the tender frame and tank, at right angles to the track, with its head end fouling the main track and its trucks bunched to the south of the car. This coach was practically demolished and the fatalities and injuries occurred in it. The second coach, of wooden vestibule construction, was thrown on its side to a position almost at right angles to the track, with the head end of the coach down the embankment and the rear end fouling the main track. The trucks of this coach lodged at the foot of the embankment. Both vestibules of the coach were crushed in, its sides were broken by striking the trestle timbers, and much of its equipment was stripped off. The third coach, which had a steel underframe, rested in an almost upright position with its head end on earth end of trestle in contact with the car ahead of it, and its rear end down the embankment, in contact with the car behind it, and about 35 feet from the west rail; this coach sustained only slight damage. The fourth coach, of wooden vestibule construction, lodged in a practically upright position, with its head end jammed against the rear end of the preceding coach and its rear end not entirely off the track. The trucks of the third and fourth cars were thrown under the third car, but were not badly damaged. The fifth car derailed was a baggage car, and was the only coach to fall to the east

or right side of the track, remaining coupled to the car behind it, while its head end was thrown a distance of 14 feet to the right, or east of the track and the coach itself leaned at an angle of about 45° towards the right. The front trucks of the coach were thrown under the car ahead of it, while the rear trucks were slightly disturbed. The front trucks of the sixth car were derailed, but the car sustained little damage and was continued in service. Beginning at a point about 21 feet north of the point of derailment and extending to the rear end of overturned locomotive, a distance of 245 feet, the track was destroyed, as was also trestle 733.

The track is laid with 75-pound steel rails, 33 feet in length, rolled in 1906 and laid in 1907. The rails are single-spliced inside and outside and are laid on about 20 oak ties to each rail, the ties being in good condition. Broken limestone, 18 to 24 inches deep, is used for ballast. Thirty-four inch, 6-hole angle bars are used, being full bolted; track is laid with even joints on tangent and staggered joints on curves. The joints on tangent which were originally laid even have crept ahead so that the joints in the westerly rail are 14 inches ahead or north of the joints in the easterly rail. Tie plates are used on curves of 2 degrees or more, and the grade, surface and alignment of track are in fair condition. The weather at the time was clear and very hot.

The first indications of derailment were at a point 113 feet south of trestle No. 733, where there were flange marks

on the ties about 7 inches inside of right or east rail and corresponding flange mark in the web of overturned or west rail. The derailment occurred about 14 feet south of the joint in the west rail, at which point this rail began to overturn and spread outward as indicated by additional flange marks on ties diverging to the left or west.

Engineer Statham stated that his train left East Waco about 3.21 or 3.22 p.m. The air brakes were properly tested at that point and were not used after leaving there. The train passed through Selby at a speed of about 15 miles per hour and at no time did it exceed its prescribed speed of 20 miles per hour. He stated that he shut off steam at about the north switch before he struck the grade and then started working steam coming out of the curve onto the straight track just south of the derailment. The train had attained a speed of about 20 miles per hour when he saw a sun kink in the left or west rail, from 3 to 5 inches in width and about half a rail length long, located about 300 or 400 feet south of the trestle. He immediately closed the throttle, or attempted to, but could not say for sure that it was closed, because of the reeking of the engine, but is sure he set the air in emergency and jumped off the right side of the locomotive. He looked at his watch immediately after the derailment and it was 3.40 p.m. His opinion was that the sun kink caused the derailment, as he noticed it just in front of the engine before it overturned and thinks the rear drivers were the first part of the locomotive

to be derailed.

Conductor Bounds stated that his train left East Gage at 3.23 p.m. He estimated its speed through Selby at 12 or 15 miles per hour, and stated that it did not at any time exceed a speed of 20 miles per hour. The first knowledge he had of the derailment was the sudden stop, indicating an emergency application of the brakes and he saw a car heading down the embankment to the east. He looked at his watch and it was 3.45 p.m. Returning to the accident about 50 minutes later, he examined the locomotive and found it with throttle wide open and the brake valve in emergency position. An examination of the track under the sixth car showed the west rail about 6 inches out of line to the west or left side, which he believed was a sun kink that was responsible for the derailment. He said that the track in front of the engine looked all right, but back of the engine the ties, as well as the rails were torn loose as though the tank had dragged them all up in a pile.

Fireman Thompson said the first realization he had of the impending derailment was when the engine rocked to the right, then to the left and he jumped from it on the left side, just as it was going over the trestle and just as it started to turn over. After it was derailed, he said the engine was lying on the ground, the wheels were turning, the throttle was open and from the noise of the exhaust, he did not think the throttle had been closed but he was sure he heard the engineman apply the air.

Head Brakeman Harvey stated he was standing behind

the engineman, looking back over the train just before the derailment; that the engine did not lurch any before it went off the track, but by the jar, he knew it was off the track and it seemed to him that the rear drivers were the first to be derailed. At the point where the trestle joined the embankment, he started to get off the engineman's side, then ran to the other side and jumped through the gangway on the left side, just as the engine was turning over.

Rear Brakeman Smith said the speed through Selby was 10 or 12 miles per hour and at the time of derailment was about 18 miles per hour, the accident occurring at about 3.45 p.m. He and the conductor were in the cupola of the caboose when they felt the shock of the stop caused by the application of the air and they were knocked down, the caboose moving about a car length after that. He said the air was tested at East Waco.

Section Foreman Hunter, a foreman of about 9 years experience who has had charge of the section of track on which the accident occurred for about 2 years, stated that his section was 6 miles long and his normal force was 6 men but since June 15th he has had only 3 men. He stated that he had been bothered with sun kinks in the track in this vicinity last summer and while he had never found it necessary to cut a rail because of expansion, he has had instances where it was necessary to wait for a rail to cool in the evening before lining it back. He was over the track about 11.30 a.m. on the date of the accident

and noticed nothing wrong with it at that time. He arrived at the scene of derailment at 5.00 p.m. and on the way discovered two kinked places in the track, one about 7 poles north and one about 12 poles north of where the derailment occurred; one of these he stopped and lined up. He stated that the track was about $2\frac{1}{2}$ inches out of line under the last car derailed.

Division Roadmaster Warren stated that during 1900, the grade between mile posts 670 and 671 was raised from 18 inches to 4 feet, the ends of the ties being boxed in or shouldered from the bottom with rock and the track dressed flush with the top of ties, and was maintained in this condition until 1917, at which time a good deal of the shoulder and ballast was used in re-surfacing track; because of the inability to secure ballast, they were unable to fill in the track and box up the shoulders as they surfaced it, and this accounted for the partially filled or light-dressed track without shoulders at the point of derailment or for a distance of about 240 feet south of the bridge. He said that, due to the passage of 3 heavy troop trains over this section of track in the same direction within 3 hours and in the heat of the day, the track had drifted $2\frac{1}{2}$ inches north. He stated that the track had buckled to the left 6 inches under the last coach derailed and in his opinion it was this kink which caused the derailment.

Engineer of the Maintenance of Way W. H. Vance stated

that only 67 ties on this mile of track required renewal during 1918. He examined the track after the derailment and was of the opinion that the tender or one of the cars was first derailed, as the track under the engine was not disturbed, nor did the engine move forward after turning over and the condition of the coupling bar indicated that the engine had been turned over by the tender. His opinion was that a sun kink caused the derailment.

Superintendent Callahan stated that he made a close inspection of the track after the derailment and found the first point of derailment about 14 inches south of the joint on the west rail, about 113 feet south of trestle 733. He was of the opinion that the derailment was caused by the track buckling to the left, caused by the excessive heat. He thought that when the wheels of the tender struck this kinked condition of track, the flange of the left wheel forced the left hand rail to turn over, permitting the wheel on the right hand side to drop to the ties inside the east rail; an inspection of the track immediately under the last car derailed and which had but one pair of trucks off, indicated that the track had been out of line, doubtless due to buckling. The fact that the coupling bar between the locomotive and tender was twisted to an angle of 45 degrees indicated to him that the locomotive was derailed by the overturning of the tender behind it.

An inspection of engine 510 was made at East Waco

on June 22, in company with Mechanical Superintendent B. J. Peaseley, and nothing was found about the tires, wheels or flanges that could have caused the derailment. There was 1/4" lateral in the driving boxes and 1/2" in the engine truck wheels. The axle to the lead wheel in the front tender truck was bent between the wheels and both journals were bent, these defects being a result of the derailment.

This accident was caused by a sun kink, the track in front of this train buckling, due to its unsupported condition. The location of the derailment was between an ascending and a descending grade, at which place there is a tendency for the track to creep towards its lowest point from both directions and this, together with the unsupported condition of the track at and near the point of derailment, permitted the track to buckle due to expansion caused by the high temperature. The official temperature reading at 4 p.m. on the date of the accident was 103 $\frac{1}{2}$ ° F. This section of track was not properly supported by ballast, and should not have been permitted to remain in that condition.

Attention is directed to the fact that a car of light wooden construction and with open platforms was placed immediately behind the locomotive, the heavier coaches of steel and steel-underframe construction following, while 6 freight cars were hauled at the rear of the train. This arrangement undoubtedly increased the danger of injury to the passengers in the wooden coaches and it is believed that much safer prac-

tice would have been to place the heavier equipment and freight cars on the head end of the train. Had this arrangement been employed, it is possible that no fatalities or injuries would have resulted from this accident.

The train crew was composed of men of good records who were on duty about 40 minutes at the time of the accident, after a period off duty of 10 hours.