

1997

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN
ACCIDENT ON THE MISSOURI-KANSAS-TEXAS RAILROAD OF
TEXAS NEAR BRUCEVILLE, TEX., ON JULY 31, 1935.

October 26, 1935.

To the Commission:

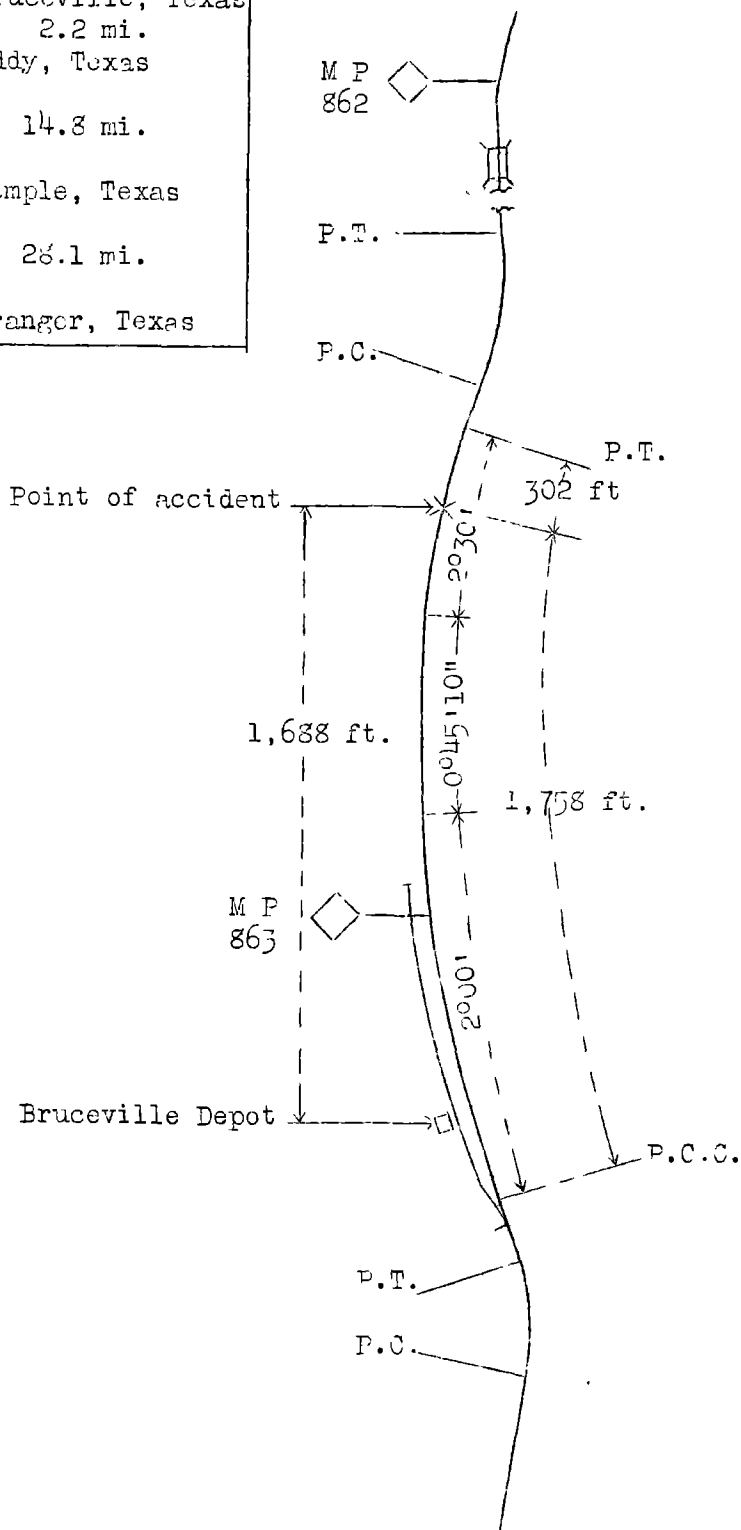
On July 31, 1935, there was a derailment of a freight train on the Missouri-Kansas-Texas Railroad of Texas near Bruceville, Tex., which resulted in the death of 3 trespassers and the injury of 7 trespassers.

Location and method of operation

This accident occurred on that part of the San Antonio Division of the South Texas District extending between Granger and Bellmead, Tex., a distance of 65.1 miles; in the vicinity of the point of accident this is a single-track line over which trains are operated by time table, train orders, and an automatic block-signal system. The accident occurred at a point 1,638 feet north of the depot at Bruceville; approaching this point from the south, there are several short curves and tangents, followed by a short 2° curve to the left, 319 feet of tangent, and then a compound curve to the right 2,060 feet in length, the curvature varying from $0^{\circ}45'10''$ to $2^{\circ}30'$, and the accident occurred near the leaving end of this curve at a point 1,758 feet from its southern end, where the curvature is at its maximum. The grade for north-bound trains is descending for a distance of about 2 miles to the point of accident, and for a considerable distance beyond, varying from 0.901 to 0.999 percent, and being at its maximum where the accident occurred.

The track is on a fill and is laid with 90-pound rails, 39 feet in length, with an average of 24 ties to the rail length, tieplated, single-spiked, and ballasted with crushed rock 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 or west rail of the $2^{\circ}30'$ portion of the curve was 6 inches, while the gauge varied from $3/16$ to $3/4$ inch wide; at the point of accident the super-elevation was $5\frac{1}{4}$ inches, and the gauge was $1/4$ inch wide. Under special instructions contained in the time table, the maximum permissible speed for trains handling oil cars, loaded or empty, is 25 miles per hour.

• Bellmead, Texas
20.0 mi.
× Point of accident
• Bruceville, Texas
2.2 mi.
• Eddy, Texas
14.8 mi.
• Temple, Texas
28.1 mi.
• Granger, Texas



Inv. No. 1997
Missouri-Kansas-Texas R.R. of Texas
Bruceville, Texas.
July 31, 1935

The weather was clear and it was dark at the time of the accident, which occurred about 8:32 p.m.

Description

Train No. 70, a north-bound freight train, consisted of 70 empty and 12 loaded cars and a caboose, hauled by engine 907, and was in charge of Conductor Tidwell and Engineman Roe. This train left Temple, 28.1 miles north of Granger, at 7:40 p.m., according to the conductor, 9 hours and 5 minutes late, and was passing Bruceville when it was derailed while traveling at a speed estimated to have been about 25 miles per hour.

The train parted between the twenty-sixth and twenty-seventh cars, the forward portion being separated from the rear portion by a distance of about 1,200 feet. The engine and first 24 cars were not derailed, but the rear truck of the twenty-fifth car, MK&ToFT tank 116017, and both trucks of the twenty-sixth car, MK&ToFT tank 116240, were derailed; the front pair of wheels of the rear truck of the twenty-fifth car was derailed to the right and straddled the east rail, while the rear pair of wheels of this truck was derailed to the left and straddled the west rail, as did both pairs of wheels of the forward truck of the twenty-sixth car, while both pairs of wheels of the rear truck of this car were derailed to the right and straddled the east rail. The twenty-seventh to the fifty-sixth cars inclusive, and the forward truck of the fifty-seventh car, were derailed to the west, with the exception of one car which stopped east of the track; fire broke out in the wreckage and destroyed 10 of the derailed cars and 9 others were destroyed as a result of the accident. The fifty-seventh car stopped with its front end 103 feet north of the initial point of accident and north of this car the track was torn up for a distance of 334 feet, while the track was considerably damaged up to the point where the rear end of the twenty-sixth car stopped.

Summary of evidence

Engineman Roe stated that on reaching a point about 1 mile south of Eddy, a station 2.2 miles from Bruceville, he practically shut off steam and used a very light drifting throttle down the hill involved without applying the brakes. While traveling at a speed of about 25 miles per hour the derailment occurred, causing the air brakes to apply in emergency from the rear, and when he felt the jerk caused by the accident he thought that an air hose had burst or that the train had parted; in order to keep the two portions of the train apart

and prevent further damage by an impact between them he endeavored to keep the brakes released by releasing the independent engine brakes, placing the brake valve in release position, and working a slightly drifting throttle; after fully satisfying himself that there was no further danger of the two portions of the train getting together he placed the brake valve in lap position and left it there until the forward portion of the train stopped. Engineman Roe did not feel any run-in of slack as the train was coming down the hill, but the train crew informed him there was such a run-in and he said this probably was due to working a drifting throttle around the reverse curve with the long train, which in his opinion caused one of the tank cars to be crowded off the track. Nothing unusual occurred in the handling of the train prior to the accident and no track irregularities were observed.

In the instructions for freight train handling, contained in a pamphlet issued January 27, 1933, by W. E. Vergan, Air Brake Supervisor, and approved by H. W. Warden, Chief Mechanical Officer, item 30, under the heading "Slowing", reads as follows:

Keeping the slack out with a pulling throttle while the brakes are applied is very important for releasing while running. Where such a release is desired and is safe, where speed, the reduction, etc., are favorable, reduce to a drifting throttle as the release is begun, then after the rear brakes have had ample time to release, carefully begin the use of steam. With "ET" equipment the control of the release rate, as embodied in release and holding positions, will aid in controlling the slack during release. To have proper total reduction before releasing it will generally be necessary to make additional reductions between the initial and the final. These must be made light to avoid rough slack action.

Engineman Roe said that he had not seen instructions given by the air brake supervisor requiring that a pulling throttle be used down grades and around curves for the purpose of keeping the train stretched and controlling the speed by the use of the air brakes, although he knew it was the general practice and heretofore had used that method of controlling the train, and said that had he used it on this occasion it was probable no run-in of slack would have occurred; he did not think that the speed of the train, however, warranted making a brake applicator

prior to the accident. Fireman Ritchie and Head Brakeman Davison made statements similar to those of Engineman Roe concerning the operation of the train; they did not notice any unusual run-in of slack while coming down the hill and were unaware of anything wrong until the air brakes were applied in emergency from the rear, causing a jerk on the engine.

Conductor Tidwell, who was in the caboose, said the speed was about 20 miles per hour at the top of the hill and about 25 miles per hour when the derailment occurred, saying that there was a severe run-in of slack just before the accident happened. Nothing wrong was noticed with the handling of the train en route or with track conditions, but there was an unusual amount of slack action in the train on all hills and dips, where the slack ran in and out, while on descending grades the rear end of the train ran in exceptionally hard; he could not account for the train having more slack than usual. The air brakes had been tested and worked properly, but he did not notice whether they were applied approaching Bruceville. Conductor Tidwell said that in his opinion the accident was caused by a combination of factors, the two curves causing one of the tank cars to rock to some extent and the slack action catching it at just the proper time to make it bounce slightly, resulting in a wheel on the left side mounting the rail and being derailed.

Car Foreman Ellis inspected the equipment at the scene of the accident, and was of the opinion that the forward truck of the twenty-sixth car, MK&ToFT tank 116240, was the first to be derailed, basing his opinion on the fact that the marks on the rail where the wheels hit the ties first appeared on the west side of the track and that this entire truck was derailed on that side while the rear truck was derailed on the east side; in addition, there was a considerable amount of stone and dust on the side of the forward truck of this car and in the bolster, and stone dust on the wheels, and on that side it showed that it had been off the ends of the ties and had run along in the rock ballast, eventually being pulled back upon the ties and then following the rails to where it stopped, this car also pulling the rear truck of the car ahead, MK&ToFT tank 116017, off the track. Inspection of these tank cars failed to disclose any mechanical defect that would have contributed to the accident.

Roadmaster Smith and Section Foreman Greathouse each made a separate examination of the track but nothing was found which would have caused or contributed to the accident, neither were any marks found within a distance of about 3 miles south of the point of accident to indicate dragging equipment. Roadmaster

Smith was of the opinion that the accident was due to a run-in of slack of sufficient force to cause a wheel flange to mount the outside rail of the curve.

District Engineer Gallagher stated that there was a flange mark on top of the head of the left or west rail of the 2°30' curve that started on the gauge side and extended diagonally across the rail for a distance of 12 feet, to the point where it left the rail and dropped off on the ties, continuing thereon for a distance of 17 feet 1 inch to the point where it ran off the ends of the ties. Opposite this latter point there appeared a corresponding mark on the gauge side of the right or east rail, evidently made by the other wheel, and at a point 12 feet 10 inches beyond there was another mark on the gauge side of the east rail, apparently made by the rear pair of wheels of the same truck. Beginning at a point 73 feet 5 inches farther north the track was completely torn out, this condition extending for a distance of 334 feet, after which there was considerable damage to the track for a distance of 1,435 feet to the point where the head portion of the train stopped. District Engineer Gallagher was of the opinion that the derailment was caused by a slack surge which caused the lead truck of tank car 116240 to become derailed, and it was his opinion that the position of the loads in the train, and the weight, were such as to accentuate the intensity of the run-in of slack to such an extent that the wheel climbed the rail or was forced out against the rail and mounted it.

General Master Mechanic Shanks, Superintendent Dobbins, Trainmaster Davidson, and Road Foreman of Engines McCune also attributed the cause of the derailment to slack action and slight rocking of tank car 116240; their examination of the track and equipment failed to disclose any condition that would have caused or contributed to the accident, while Mr. McCune cited two previous cases of derailments that undoubtedly were caused by failure to comply with instructions relative to keeping the train stretched and controlling the speed with air brakes while going down hill, resulting in run-in of slack while the train was drifting and causing a car to be derailed. The term "pulling throttle" as used in the freight-train-handling instruction pamphlet previously referred to, was defined in item 8 as meaning the use of enough steam so the engine will pull on the train, tending to keep the slack out, and readjusting for changes in speed, and Mr. McCune said that after the issuance of the pamphlet, the instructions were further amplified by having the air brake supervisor go over the road and meet with enginemen at different terminals and also make road trips on freight trains, instructing the men that the use of a pulling throttle was to keep freight trains

stretched going down hill and around curves, controlling the speed by the use of the brakes, and he said that this had been the general practice and was understood by all of their engine-men. Trainmaster Davidson thought the severity of the slack action was due to failure to work a pulling throttle down the grade and to failure to apply the brakes at the usual place, about 1 mile south of where the accident occurred.

Examination of the track south of the point of accident by the Commission's inspectors as to super-elevation, gauge and cross levels failed to disclose any condition that would have contributed to the accident, while the marks of derailment and track damage were found to be practically the same as previously described by the district engineer.

Thorough inspection made of the two tank cars involved failed to disclose any defect that would have contributed to the accident. The trucks were in good alinement, the wheels were in good condition, all flanges having good contour, and the side-bearing clearance was normal. The cars were loaded with fuel oil at the time of the accident. These cars were built in August, 1920, and had a capacity of 10,113 gallons or 100,000 pounds; they were equipped with Andrews trucks, with cast-steel side frames.

Discussion

The evidence indicated that the front pair of wheels of the lead truck of the twenty-sixth car, MK&ToFT tank car 116240, were first to be derailed and that afterwards the rear pair of wheels of this same truck also were derailed and the truck slued diagonally to the rails, shearing off bolt heads, forcing the left or west rail outward, and on reaching a point 103 feet from the initial point of derailment the truck tore out rails and ties, derailling the following 31 cars and pulling off the rear truck of the twenty-fifth car, MK&ToFT tank car 116017. The derailment of the rear truck of the twenty-fifth car was apparently a result of the accident as evidenced by the fact that when that car stopped the front pair of wheels were over the right rail and apparently had been running in that position from the point where the track was torn up to the point where the car stopped, a distance of about 1,435 feet, while there was no flange mark on the outside of that rail between the point of derailment and the point where the track was torn up. Further evidence that the lead truck of tank car 116240 was the first to be derailed is the fact that the outer sides of its left wheels showed that they had been plowing along in the crushed stone ballast while in a slued position, and the truck bolster had picked up considerable of this ballast. This car

was equipped with Andrews cast-steel truck side frames; the bottom section of the right front frame on the outside had been chafing the right rail, which had cut a groove in this side frame about 1 inch deep and about 3 inches wide for the entire length of the section, indicating that this truck had straightened up after the car had separated from the rear portion of the train and that it had been chafing the right rail until it finally stopped.

Engineman Roe said that he had not seen the instructions about using a pulling throttle when going down hills and around curves in order to keep the train stretched and then to control the speed by use of the air brakes; however, he knew it was the practice and said that he usually followed that method of handling freight trains, and that had he done so in this case, instead of using a very light drifting throttle, there probably would not have been any run-in of slack.

The evidence was clear that there was an excessive run of slack and that this slack action, occurring on a reverse curve and a descending grade, was one of the principal factors which caused this derailment. This is supported by statements of members of the train crew, the roadmaster, district engineer, trainmaster, road foreman of engines and the general master mechanic.

In recent years the matter of unresisted slack has been given extensive consideration in connection with freight car maintenance. In 1934 the American Railway Association appointed a joint sub-committee, representing the Committee on Couplers and Draft Gears and the Arbitration Committee, to consider the question of immediate improvement of existing draft gears, including the matter of systematic inspection and maintenance and more progressive elimination of inefficient draft gears from service. As a result of its study this sub-committee submitted recommendations on "Inspection and Maintenance of Draft Gears and Attachments by Car Owners", which were duly approved by the General Committee of the Association of American Railroads, submitted to vote by letter ballot, as a result of which the following recommended practice was adopted by a vote representing 93 percent of the freight cars in revenue service:

"1. When cars are on repair tracks for periodic air brake attention, examine and renew defective parts of draft gears, couplers and their attachments and supports. This will not require removal of draft gear for this examination, except where found defective or

where total slack from coupler horn to striking casting exceeds $1\frac{1}{2}$ inches; slack to be the difference in distance between coupler striking horn and striking casting when coupler is pulled out with a bar and sledged back solid.

2. When cars are undergoing general repairs, draft gears will be dropped for examination, and couplers, their attachments and supports will be inspected and necessary repairs and replacements made.

3. In renewing defective draft gears, certified gears should be applied if spacing permits, or serviceable second-hand gears of other types, not considered inefficient or obsolete as per list shown in A.A.R. Interchange Rule 101, may be applied. Certified gears must be renewed with certified gears."

The results of this letter ballot were submitted to member carriers of the Association of American Railroads under date of October 31, 1934, and the effective date of the recommended practice was set for March 1, 1935.

On January 7, 1935, the attention of member carriers was again directed to this subject by issuance of A.A.R. Circular DV-826, with the following request:

"Car owners are requested to see that these rules are strictly enforced on their own cars, in order to improve the condition of the couplers and draft gears by the elimination of the slack in the gears as far as possible."

In the 1935 report of the Committee on Couplers and Draft Gears, in discussing the reduction of unresisted slack in train service, it is stated:

"The $1\frac{1}{2}$ " limit was established because of the high percentage of cars that will require attention even under this limit."

Further it is stated:

"That appreciable and effective reduction in unresisted slack will be realized through the application of certified draft gears and the reduction of unresisted slack through compliance with the draft gear maintenance program that was established the first of this year."

The consist of the train involved in the accident here under discussion shows that 23 cars, or 28 percent, were M-K-T cars and 59 were foreign and private-line cars. An investigation of draft gear maintenance practices on the M-K-T disclosed that this carrier has made progressive efforts to comply with A.A.R. recommended practice, that instructions in accordance with the A.A.R. action noted above were promptly issued prior to the date they became effective, and that these instructions are in possession of the supervising foreman at each car repair point on the line and are being carried out in a reasonable manner.

Strict compliance by all carriers and car owners with the recommended practice set up by the A.A.R. is essential if the expected and much needed improvement in this matter is to be realized and such defective equipment eliminated from general interchange movement.

Conclusions

This accident was caused by a run-in of slack of sufficient force, when coupled with the rocking motion of a loaded tank car, to result in that car mounting the outside rail of a curve.

Respectfully submitted,

W. J. PATTERSON,

Director.