214 G.M.&S.

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE GULF, COLORADO & SANTA FE RAILWAY NEAR BIG CREEK, TEX., ON JUNE 21, 1924.

August 1, 1924.

To the Commission:

On June 21, 1924, there was a derailment of a work train on the Gulf, Colorado & Santa Fe Railway near Big Creek, Tex., resulting in the death of one employee and the injury of two employees.

Location and method of operation

This accident occurred on that part of the Beaumont Division extending between Somerville and Silsbee, Tex., a distance of 152.2 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 on a fill about 10 feet in height, at a point 642 feet north of the north switch of the siding at Big Creek. Approaching the point of accident from either direction the track is straight and practically level. The track is laid with 85-pound rails, 33 feet in length, with about 20 to 22 ties to the rail-length, single-spiked, tie-plated, and ballasted with gravel, about 12 inches in depth, and is well maintained. Under time-table rule the maximum speed limit for freight trains is 25 miles an hour; no further restriction in the case of an engine backing up is prescribed. The weather was cloudy at the time of the accident, which occurred at about 5.15 p.m.

Description

Southbound work extra 158 consisted of engine 158, backing up, hauling one bunk car, one ditcher, and a caboose, in the order named, and was in charge of Conductor McCarty and Engineman Stevens. After completing work for the day this train proceeded to Cleveland, the southern point of its working limits, where orders were ob-

tained to run extra to Silsbee, 57.3 miles distant; also orders were received requiring speed to be reduced to 10 miles an hour at four different points between Cleveland and the point of accident, these orders were made complete at 4.38 p m. The train departed at about 4.40 p. m., and after having proceeded a distance of about 14½ miles was derailed while traveling at a speed variously estimated from 12 to 35 miles an hour.

The tender and engine came to rest on their left sides, coupled but badly damaged, at a point 244 feet south of the first mark of derailment, the rear portion of the engine being across the track. The bunk car was derailed to the west and came to rest on its right side, with its head end down the embankment, and just north of the engine. The ditcher and caboose were also derailed but remained upright on the roadbed, the wheels standing on the web of the overturned east rail. The employee killed was the engineman.

Summary of evidence

Fireman Belt stated that as soon as the conductor delivered the train orders to the engineman at Cleveland the train departed, at 4.40 P, M. Just before the accident occurred the engineman made a light application of the brakes, reducing speed from about 20 miles to not more than 15 miles an hour, and just as the brakes were released Fireman Belt saw the rear of the tender on the engineman's side rise and then drop, after which the engine turned over. When the engine came to rest Fireman Belt was burned by escaping steam; he worked his way through vegetation at the side of the roadway to the track ahead of the derailed locomotive, and because of his burns he started to remove his clothes; while doing so he noted that it was 5.17 p. m. He further stated that there were about 1,200 or 1,300 gallons of fuel oil and about 800 gallons of water in the tender at the time of the accident; that the air brakes worked properly en route, that in his opinion the water and fuel oil being low and the tender being small, on encountering a low spot in the track, the tender rocked sufficiently to cause its derailment.

Conductor McCarty stated that extra 158 left Cleveland at about 4.35 p. m., however, this was three minutes before the orders addressed to his train at that point were made complete. He also said the accident occurred between 5.24 and 5.25 p. m., but in his telegraphic report to the railway company shortly after the accident occurred he gave the time of the accident as 5.20 p. m. He further stated that the speed was only about 15 miles

an hour when the air brakes were applied just before the derailment occurred and between 12 and 15 miles an hour at the time of the accident, that about five minutes after the accident occurred he saw the fireman standing in the middle of the track about a hundred feet south of the engine; and that in his opinion the accident was caused by excessive surging of the fuel oil and water in the tender.

The statements of Head Brakeman Hawkins and Flagman Williams practically corroborated those of Conductor McCarty. Flagman Williams also said that there seemed to be a low spot in the track about two rail-lengths north of where the caboose stopped, at a cattle guard, the tender climbing the rail about a half rail-length from the low joint. None of the members of the crew knew of any defect about the engine or tender; the engine had frequently been operated backward in work-train service during several days preceding and no trouble had been experienced.

Section Foreman Anderson stated that after the accident a member of the crew of extra 158, on returning to Rayburn, informed him in substance that the train was running rather fast at the time of the accident. On the day prior to the accident he removed tie plates which had been used as shims under the west rail at the cattle guard, located just north of where the accident occurred, and replaced them with wooden shims to obtain a better bearing; after this had been done this rail was about one-quarter inch higher than the east rail at this point.

Trainmaster Donnelly stated that earlier in the day of the accident he passed over the track in the vicinity of the point of accident at a speed of 30 or 40 miles an hour, riding on the caboose of a freight train, and at that time noticed no unusual track conditions. He said the speed of engines backing up is left to the judgment of the conductor and engineman, who are expected to exercise particular caution when operating an engine backward.

Division Engineer Brady and Roadmaster Koonce stated that the initial marks of derailment were very light, indicating high speed at the time they were made. There were no marks on top of the east rail, from which they concluded that the rear tender wheels jumped clear over it, the first marks appearing on a tie plate. The engine came to rest 244 feet from the initial mark of derailment, skidding on the rails for about 50 feet of this distance after turning over on its left side. The brake valve on the engine was practically in full release position, the throttle about half open, and the

reverse lever in backward motion at a point on the quadrant where an engine is generally worked when the train is running at full speed backing up. There was no indication of dragging equipment. There was a wheel flange mark on a tie plate, just outside the base of the east rail and about 31 feet south of the cattle guard; there was no corresponding mark near the west rail. This mark continued for a distance of 20 feet to the ends of the ties. At this point corresponding wheel marks appeared on the ties on the gauge side of the west rail, leading gradually toward the east for a distance of about 84 feet where the east rail was struck and turned over, the following three rails were also turned over. The west rail was only slightly out of alignment. North of the initial mark of derailment there were only slight irregularities in elevation.

Road Foreman of Engines Holloway stated that he inspected engine 158 after the accident but found no defects that in any way could have caused or contributed to the derailment. The throttle and reverse lever were about in the positions where they would be operated with a light train. He was of the opinion that the accident was caused by excessive surging of the water and fuel oil in the tender, due to the speed of the engine, which caused the tender to rock and resulted in the derailment.

Engine 158 is of the 4-6-0 type, having a total weight, engine and tender, loaded, of 195,800 pounds. The tender has two four-wheel trucks, and a loaded weight of 70,700 pounds, it has been converted for use with an oil-burning locomotive, the oil tank being installed where the coal compartment originally was, and an auxiliary tank extending 2 feet 2 inches above the top of the water cistern, its top being 10 feet 3 inches above the rails. The tender has a water capacity of 5,000 gallons, and a fuel oil capacity of 1,948 gallons. There were no swash plates in the water cistern, with the exception of what appeared to have been a brace board applied across and near the top sheet or covering, while in the auxiliary oil tank there were no swash plates to guard against surge.

Conclusions

This accident is believed to have been caused primarily by an engine being operated at excessive speed while running backward.

The tender involved in this accident was originally constructed to carry coal but had later been converted for use with an oil-burning locomotive, an auxiliary fuel-oil tank 26 inches in depth being placed above the water cistern. This auxiliary tank had no swash plates and the evidence indicates the fuel-oil in the tank at the time of derailment was about six inches in depth, water in the cistern was low, and as a consequence conditions were such as to cause or to promote excessive rocking or oscillation.

Inspection of the track at this point disclosed no condition which under normal operating conditions would be dangerous, but in this case the rocking of the tender due to running at relatively high speed and the slight irregularities in the track were augmented by the surging of the fuel-oil in the auxiliary tank on top of the cistern, the rocking which resulted from these combined forces being sufficient to cause the derailment of the tender.

Widely differing estimates of the rate of speed at the time of derailment appear in the evidence. Members of the crew estimate the speed to have been 15 miles an hour or less at the time of the accident. However, according to Fireman Belt's statement, the train traveled the distance of about 14½ miles between Cleveland and the point of accident in approximately 35 minutes. Accordingly, the average speed of this train for a considerable distance closely approximated the maximum speed allowed by rule, and it is a reasonable conclusion from the evidence that instead of exercising particular caution because of the fact that the engine was being operated backward the maximum speed limit prescribed for freight trains was exceeded. In order to maintain this average and to comply with slow orders effective at four points within this distance it was necessary materially to exceed this average rate at some points en route. From the character of the first marks of derailment, the condition of the wreckage, the distance the equipment traveled after it became derailed, and the manner in which it came to rest it is believed that at the time of derailment the speed was in excess of the maximum speed allowed by rule.

The record in this case contains evidence furnished by a train-master who was riding another freight train which materially exceeded the prescribed limit, apparently without special authorization and without criticism by the official who observed this infraction of the rule.

It therefore appears that existing speed regulations on this road are not being observed or enforced.

It is common practice to prescribe definite and more rigid speed restriction for engines being operated backward than when headed in the direction of movement but this was not done on this road. Had the speed of the train involved in the derailment been maintained within proper limits, this accident would undoubtedly have been prevented. The railroad company should promptly take necessary measures to provide and to enforce proper speed regulations, the need of which has been disclosed by the investigation of this accident.

All of the employees involved were experienced men. At the time of the accident they had been on duty 10 hours and 20 minutes, previous to which they had been off duty 13 hours and 20 minutes.

Respectfully submitted,

W. P. BORLAND,

Director.