INTERSTATE COMMERCE COMMISSION.

REPORT OF THE CHIEF OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE MISSOURI, KANSAS & TEXAS RAILWAY OF TEXAS NEAR WARNER JUNCTION, TEX., ON JANUARY 17, 1922.

March 16, 1922.

To the Commission:

On January 17, 1922, there was a head-end collision between a passenger train and a work train of the Missouri, Kansas & Texas Railway of Texas near Warner Junction, Tex., resulting in the death of 1 employee, and the injury of 11 passengers and 3 employees.

Location and method of operation.

This accident occurred on the Choctaw Division, extending between Muskogee, Okla., and Denison, Tex., a distance of 157.3 miles, which in the vicinity of the point of accident is a single-track line over which trains are operated by time-table, train orders, and an automatic block-signal system. The accident occurred approximately 3,350 feet north of Warner Junction; approaching this point from the north there is a 1-degree 57-minute curve to the left 3,608 feet in length, then 1,620 feet of tangent extending across the bridge spanning the Red River, followed by a 3-degree curve to the left 1,733 feet in length, then about 4,000 feet of tangent, the accident occurring on this tangent at a point 698 feet beyond the curve. Except for two short sections of practically level track, the grade is descending for southbound trains, varying from 0.237 to 1.011 per cent, for a distance of about 3 miles, followed by about 800 feet of level track extending to the point of accident. The bridge spanning the Red River consists of five spans, averaging approximately 300 feet in length, the track across which is used jointly with the St. Louis-San Francisco Railroad, which road leads off the main track of the Missouri, Kansas & Texas Railway of Texas at switches located short distances north and south of the bridge, known as North Frisco Junction and South Frisco Junction, respectively.

The track, switches, and signals between North Frisco Junction and Warner Junction are within the limits of an interlocking plant, the tower being located at North Frisco Junction. Approaching from the north, the following signals are encountered; home interlocking signal 20, located just north of the switch of the St. Louis-San Francisco Railroad at North Frisco Junction, interlocking route signals 8 and 9, mounted on a single mast at South Frisco Junction,

just north of the switch where the track of the St.Louis-San Francisco Railroad leads away from that of the Missouri, Kansas & Texas Railway of Texas; and semiautomatic signal 6561, which is 564 feet south of signals 8 and 9, and which governs to a point beyond where the accident occurred, about 3,000 feet south of signal 6561. Signal 6561 is of the three-position, upper-quadrant type, normally displaying a stop indication, and is the beginning of the automatic block system; no distant signal is installed in connection with it. Under special instructions in the time-table, trains move between Warner Junction and North Frisco Junction by automatic and interlocking signal indications, disregarding time-table superiority. There was also a practice in effect, not required by rule, of stopping southbound trains at signal 20 when the track was occupied between that point and Warner Junction; under such circumstances the crew would on some occasions receive verbal instructions authorizing them to proceed as far as signal 6561. The weather was clear at the time of the accident, which occurred at about 3.35 p.m.

Despription.

Work extra 693 consisted of 1 convoy car and a caboose, hauled by engine 693, and was in charge of Conductor Geer and Engineman Sinclair. This train was working under an order giving it no rights against regular trains. The convoy car and caboose were cut off and the engine was moved about 300 feet to the north, where the work of spurring out a ditcher was being carried on; the engine was standing at this point at the time it was struck by train No. 5.

Southbound passenger train No. 5 consisted of 1 express car, 1 refrigerator car, 3 baggage cars, 1 mail car, 1 coach, 2 chair cars, 1 dining car, 3 Pullman sleeping cars, and 1 business car, hauled by engine 407, and was in charge of Conductor Smith and Engineman Hohnel. The 3rd, 4th, 5th, 9th, 10th and 11th cars were of all-steel construction, while the remainder were of steel-underframe construction. At Atoka the crew received a copy of train order No. 138, form 19, reading as follows:

"Approach K O G and M K T Crossings
Durant under Control
Reduce to 15 Miles Per Hour
over track Between Red River
Bridge and Warner Jct
Where Spurring out Ditcher."

Train No. 5 left Atoka at 3.30 p. m., 5 minutes late, passed North Frisco Junction, the last open telegraph office, at 3.33 p. m., 7 minutes late, and collided with engine 693 while traveling at a speed variously estimated to have been between 15 and 30 miles an hour.

Engine 692 was driven backwards a distance of about 345 feet, striking the convoy car and caboose and driving them southward an additional distance of about 100 feet; engine 692 was practically demolished. The passenger train came to rest with the engine about 310 feet beyond the point of collision, with the engine truck derailed to the right and some of the cars slightly damaged. The employee killed was a bridgeman.

Summary of evidence.

Before the work train left Warner Junction, Roadmaster Gallagher told Conductor Geer to communicate with Dispatcher Garrison and have an order issued protecting the work of spurring out the ditcher; this action was taken and resulted in the issuing of train order No. 138. The work train then proceeded to the point where the work was to be performed, and the convoy car and caboose were cut off and left standing on the main track, after which the engine was moved forward a short distance. After the ditcher had been spurred out, the conductor and engineman decided that the main track would not be connected by the time the passenger train arrived, so Head Brakeman Yeargan was instructed to protect; according to the engineman and conductor it was 3.05 p. m. when these instructions were given to the brakeman. The work of connecting the main track had been completed and the engineman has received a back-up signal, when the fireman gave warning of the approach of the passenger train, engine crew jumping just before the collision occurred. Engineman Sinclair said his engine was moving slowly backward at the time it was struck, while Fireman Clark said it was standing still.

Head Brakeman Yeagan stated that it was about 3.13 p. m. when he received instructions to protect, and when about 3 car-lengths north of the engine, on his way back to flag, he looked at his watch and it was then 3.17 p. m. According to his statement he had reached a point approximately 1,732 feet north of the point of accident, this being on the curve just south of signal 6561, which he saw displaying a stop indication, when the passenger train came into view. He said he began to give stop signals, but that no attention was paid to them, and that the engine was working steam when it passed him, at a speed of 45 or 50 miles an hour.

Engineman Hohnel and Fireman Miller, of train No. 5, stated that after discussing train order No. 138, they decided the 15-miles-an-hour restriction applied only at the point where the ditcher was being spurred out, and that it referred to a pile driver at bridge 6561, just south of the point of accident, and the engineman said he intended to have the train under control at that point. A clear signal indication was received at signal 30 North Frisco Junction,

and on account of being late steam was worked while crossing Red River bridge, the speed being increased to between 40 and 45 miles an hour, according to Engineman Hohnel, when the south end of the bridge was reached; he said a light application of the air brakes had been made and the brake valve placed in the lap position preparatory to shutting off steam and drifting down to where he thought the slow order applied, when as the engine was leaving the south end of the bridge he saw signal 6561 displaying a stop indication; he then made an emergency application of the air brakes and opened the sanders, and after passing the signal he saw the flagman giving stop signals, sounded the whistle and jumped; he estimated the speed of the train at the time of the collision to have been about 10 miles an hour. Engineman Hohnel stated that had the flagman reached the straight track south of the bridge and flagged within plain view, the train could have been brought to a stop in time to have averted the collision. Fireman Miller stated that as the train reached the south end of the bridge, traveling at a speed of about 50 or 60 miles an hour, he called the engineman's attention to the flagman, and the engineman began to apply the air brakes; shortly afterwards he saw engine 693 and shouted to the engineman, who made an emergency application of the air brakes. Fireman Miller was riding on the engine at the time of the collision and estimated the speed of the train at this time to have been between 25 and 30 miles an hour.

Towerman Wadsack stated that during the afternoon, Dispatcher Garrison frequently inquired and was informed as to the location of the work extra. When train No. 5 reached Colbert, 8.7 miles north of North Frisco Junction, the bell in the tower warned of its approach; Towerman Wadsack immediately notified the dispatcher and inquired as to holding this train on the north side of Red River bridge, stating the work extra was still at work, but the dispatcher instructed him to permit the passenger train to proceed, as the crew had a slow order, and the work extra would be looking out for the passenger train. Dispatcher Garrison stated that Towerman Wadsack notified him the track was clear, otherwise, he would have instructed him to hold the passenger train at North Frisco Junction, as had been the practice, Towerman Cox was in the tower as train No. 5 approached and overheard Towerman Wadsack's conversation with the dispatcher, while Operator Ham, on duty at Atoka, and Rear Brakeman Harrelson, of work extra 693, who was stationed at Warner Junction, were listening in on the telephones at those points and heard the entire conversation; these three employees stated the towerman notified the dispatcher that the block in question was occupied.

Tests made subsequent to the accident disclosed that from the engineman's side of a southbound engine, it is possible to see signal 6561 through the front cab window while crossing Red River bridge, starting at about the middle of the center span, for a distance of approximately 187 feet, after which the signal is obscured from view until the engineman is within 100 feet of it; from the fireman's side of the cab, this signal could be seen from the north end of the south span of the bridge, a distance of approximately 830 feet, while the fireman's view of the point of accident is limited to about 3,485 feet.

The investigation developed that there was not a clear understanding on the part of employees as to the interpretation to be placed on a clear indication by signal 30. It was the understanding of Engineman Hohnel that when signal 30 displayed a clear indication, the track would be unoccupied as far as Warner Junction; he had never found signal 6561 displaying a stop indication after receiving clear indications at preceding signals except under unusual circumstances, as when he had a message that it was out of order, and he fully expected to find it in the clear position on the day of the accident. These erroneous impressions undoubtedly resulted from the practice of stopping southbound trains at signal 30 when the track was occupied between that point and Warner Junction, and they also prevailed among other members of the crew of train No. 5. It also appeared to have been the practice, if a clear indication was received at signal 30, for southbound trains to be operated through this territory without reducing speed with the expectation that signal 6561 would be displaying a clear indication.

Conclusions.

This accident was caused by the failure of Engineman Hohnel, of train No. 5, properly to control the speed of his train as required by a train order, and his failure properly to obey the stop indication of signal 6561; and by the failure of Flagman Veargan, of work extra 693, properly to protect his train.

Engineman Hohnel said he had intended to have the train under control at the point where he thought the slow order applied, which was in the immediate vicinity of where the accident occurred, and he thought he had reduced the speed of the train to about 10 miles an hour at the time of the accident. That this estimate is too low is apparent from the fact that the engine of the work extra was driven backward a distance of more than 300 feet and practically demolished, while it struck the two cars then composing its train with sufficient force to drive them back an additional distance of about 100 feet. When it is considered that this damage was caused after train No. 5 had traveled a

distance of approximately 2,000 feet with the brake valve in the emergency position, it seems clear that the speed of the train must have been very high at the time the brakes were applied, and also that either the brakes were not in proper working order or that the engineman did not obtain an emergency effect on account of previously having made a slight service application. In view of Engineman Hohnel's own statement that the brakes were in good condition, and that there is no evidences to the contrary, it seems probable that the service application which he made as his train was leaving the bridge was sufficient to prevent him from obtaining an emergency effect when he saw signal 6561 in the stop position. In any event, it is apparent that the engineman did not control the speed of his train as required by the slow order, in view of the information and instructions contained in this order, he should have reduced the speed of his train to such an extent as to be able to control it with a service application of the air brakes.

Under the rules and instructions governing the use of interlocking and automatic signals, the clear indication of interlocking signal 30 was no authority for train No. 5 to expect that signal 6561 would be in the clear position, and Engineman Hohnel should have approached that signal prepared to stop his train before passing it, should it be found in the stop position. Engineman Hohnel's failure properly to obey signal 6561 was due to his erroneous impression that signal 30 in clear position indicated that signal 6561 was also clear. This impression apparently was created by the practice followed by the towerman at this point of holding signal 30 in the stop position until the entire route was clear in order to avoid stopping trains on the bridge and delaying other movements.

According to his own statement Flagman Yeargan had 33 minutes in which to protect his train after having been instructed to do so, while according to the statements of other members of his crew he had approximately 30 minutes at his disposal; under such circumstances there is no reason why he should not have given his train proper protection, and had he continued back around the curve and flagged train No. 5 from the south end of the tangent track, Engineman Hohnel undoubtedly would have been able to stop his train in time to avoid the collision.

One of the primary causes of this accident was the failure of an engineman properly to observe the stop indication of an automatic signal. To guard against such failures is the function of the automatic train stop, but under the conditions existing at the time it is probable that an automatic train stop would not have prevented the accident

resulting from this failure. The evidence discloses that the engineman made an emergency application of the brakes before passing the signal in the stop position, which is all that could be accomplished by an automatic train stop. The failure of the emergency application to stop the train was probably due to the prior service application or inefficient air-brake equipment. An efficient air-brake system is one of the fundamental requirements if the automatic train stop is to afford the protection for which it is designed.

At the time of the accident the crew of train No. 5 had been on duty 9 hours or less, and the crew of work extra 692, and the dispatcher and operator, less than 8 hours; previous to going on duty all of these employees had been off duty 16 hours or more.

Respectfully submitted,

W. P. Borland,

Chief, Bureau of Safety.