INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE PENNSYLVANIA RAILROAD AT FRANKFORD, PA , ON MARCH 28, 1930.

April 24, 1930.

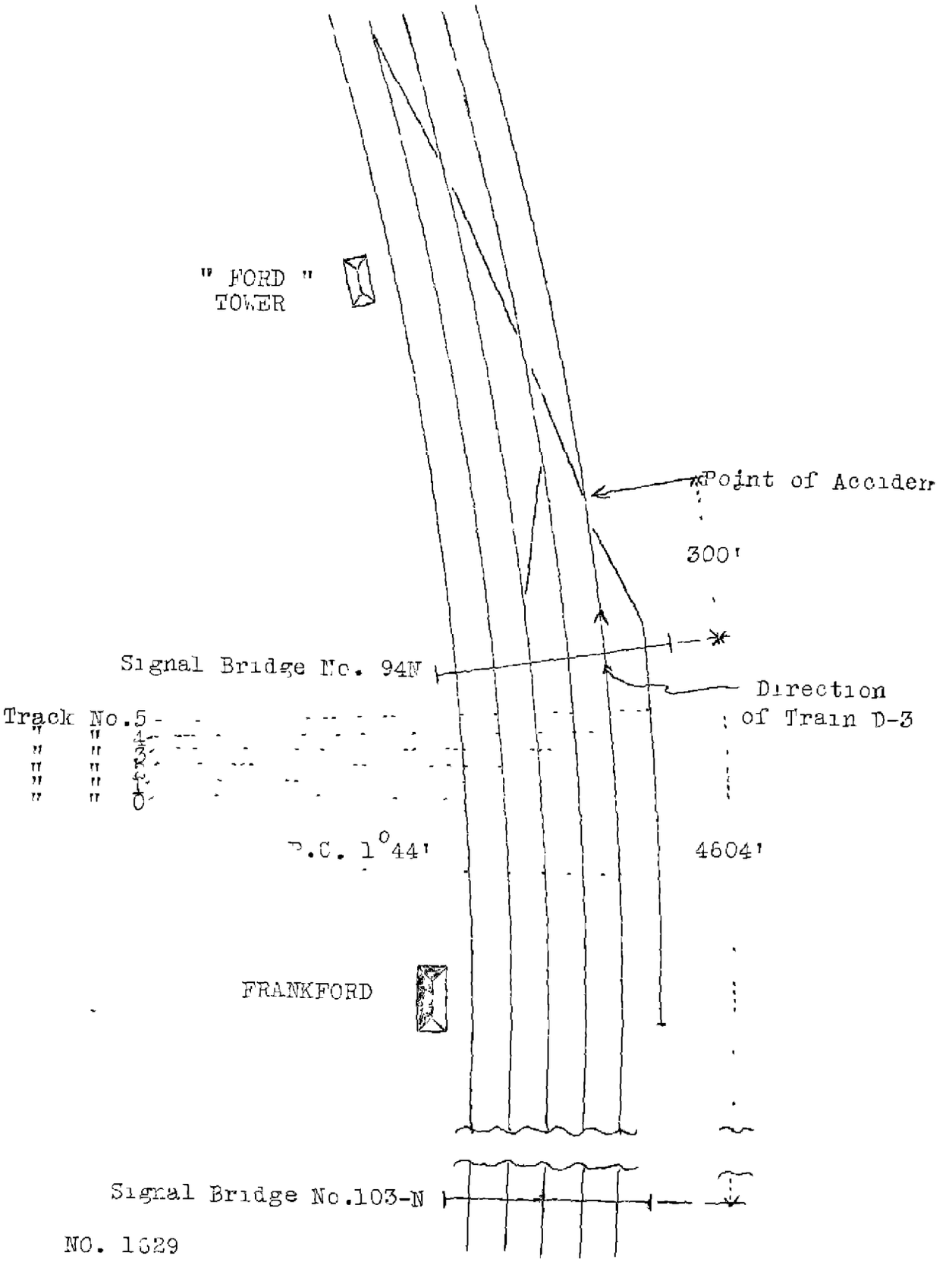
To the Commission'

On March 28, 1930, there was a derailment of a freight train on the Pennsylvania Railroad near Frankford, Pa., resulting in the death of two employees.

Location and method of operation

This accident occurred on the Philadelphia Terminal Division of the Eastern Region, in the vicinity of Ford block station, located 9.3 miles east of Philadelphia, this is a four-track line over which trains are operated by time-table, train orders, and an automatic block-signal system. The tracks are numbered from south to north, 1, 2, 3 and 4, the accident occurring at the No. 20 facing-point crossover leading from track 4, the westbound or inward passenger track, to track 3, the inward freight track. The east crossover switch is located about 300 feet west of signal bridge 94N, which bridge spans all four main tracks, as well as an additional track on the south side thereof. Approaching the point of accident from the east, the track is tangent for more than 1 mile, followed by a 1° 44' curve to the left about 1,900 feet in length, the accident occurring on this curve at a point about 1,050 feet from its eastern end. The grade for westbound trains is 0.24 per cent descending at the point of derailment The track is laid with 130-pound rails, 33 feet in length, with about 22 ties to the rail-length, fully tie-plated and spiked, and ballasted with crushed rock to a depth of about 18 inches; the track is well maintained.

The switches and signals in this vicinity are controlled from Ford block station, located south of the tracks and about 800 feet west of signal bridge 94N. This block station is equipped with a 48-lever Saxby and Farmer mechanical machine, the switches controlled from the tower are equipped with facing-point locks and the levers are electrically locked by both route and detector locking. The signals are of the position-light type, with the crossover involved lined for a movement from track 4 to track 3, such as was the case in this instance, the home signal over track 4 on signal bridge 94N displays a clear-restricting indication, while the distant signal over track 4 on



NO. 1629
PENNSYLVANIA R. R.
FRANKFORD, PA.
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signal bridge 103N, located 4,604 feet east of signal bridge 94N, displays an approach-restricting indication.

The weather was clear at the time of the accident, which occurred about 11 48 p.m.

Description

Westbound freight train D-3, extra 1695, consisted of 47 cars and a caboose, hauled by engine 1695, and was in charge of Conductor McColley and Engineman Hagan. This train passed Holmes, 3.8 miles east of Ford block station, at 11.44 p.m., moving on track 4, and was derailed at the east switch of the crossover leading to track 3 at Ford block station while traveling at a speed variously estimated to have been from 30 to 50 miles per hour.

Engine 1695 and its tender came to rest on their right sides parallel with and on track 4, the forward end of the engine being 600 feet west of the switch, while 14 cars were piled up within a space of 100 feet behind the engine and tender, blocking all of the tracks. The employees killed were the engineman and fireman.

Summary of evidence

Conductor McColley stated that the air brakes were tested before departing from Waverly at 9.10 p.m., at which point the 47 cars were picked up. To the best of his knowledge the maximum authorized speed for freight trains on the New York Division, 50 miles per hour, was not exceeded, although he was aware that his train was traveling at a good rate of speed, estimating its maximum speed to have been between 40 and 50 miles per hour. No stops were made between Metuchen, 54.6 miles from Frankford, and the point of derailment. At Cornwells Heights, 8.3 miles from Frankford, the speed through the interlocking plant was around 25 to 30 miles per hour, and after passing that point the conductor went out on the rear platform of the caboose to observe the running condition of the train, with respect to overheated journals, etc., looking along both sides of the train, at which time he estimated the speed to have been about 40 to 50 miles per hour. On passing Holmes, 3.8 miles from Frankford, he was riding in the cupola of the caboose, on the fireman's side of the train, and he estimated the speed at that point to have been between 40 and 50 miles per hour, although he stated that the maximum authorized speed for freight trains on the Philadelphia Terminal Division was 40 miles per hour. At Bridesburg, 1 mile from Frankford, the speed was about 40 miles per hour when the rear end of the train passed that point, and the conductor said he felt steam shut off, but did not recall having felt any brake application. The speed commenced

to go down, however, until the derailment occurred, at which time the air brakes applied in emergency At the time, the conductor was of the opinion that the train had come to a stop as the result of a burst air hose, or a break-in-two, saying that there was no severe jar in the caboose, and it was not until he went ahead that he learned of the derailment. Conductor McColley estimated that the speed of his train was not in excess of 30 miles per hour by the time the engine reached the crossover switch, but he could not say as to whether speed had been reduced sufficiently to negotiate the crossover in safety. Conductor McColley had worked with Engineman Hagan for about one and one-half years, he talked with the engineman at Waverly, before departing on this trip, but noticed nothing unusual about the engineman's actions or condition, nor did the engineman complain of any ailments or trouble, the conductor had also talked with Fireman Robinson and the fireman appeared normal in every respect.

Head Brakeman Wright and Flagman Peck were also riding on the caboose at the time of the accident, and their statements in substance corroborated those of Conductor McColley Head Brakeman Wright estimated the speed to have been between 20 and 30 miles per hour just prior to the accident. All of these employees were unaware that their train was going to be crossed over from track 4 to track 3.

Work of installing an overhead electric catenary system was in progress in the vicinity of Ford block station and Train Dispatcher Crist, assigned to special duty in charge of wire trains, was in the tower at that point as train D-3 approached, together with Block Operator Clifford and Leverman Kline, and according to the statements of these three employees, they saw fire fly from the wheels of the engine truck when the engine reached the switch. They fixed the time of the accident at 11.48 p.m., taking this time from the clock in the tower immediately before the electric lights were extinguished as a result of the accident. Operator Clifford said that train CS-1, the train ahead of train D-3, passed at 11.45 p.m., and that as soon as that train had cleared the circuit, or not over one-half minute afterwards, the cross-over was lined for train D-3, the approach circuit extends eastward to around Bridesburg and on being encountered by a westbound train, it actuates an electric lamp located in Ford block station directly in front of the operator, and in this instance, the crossover had been lined up before the approach light went on. Immediately after the accident, Dispatcher Crist proceeded to the overturned engine and observed that the throttle was closed and the brake valve handle in the emergency position.

At the time train D-3 approached Frankford, there was a wire train at work on track 3, with the engine headed

west and standing about two car-lengths east of the station Engineman McKnight, of the wire train, remarked about the speed of train D-3, he said that the engine was working steam and that smoke and sparks were being emitted from the stack, although required to shut off steam when passing firemen working on outriggers, and shortly after the train had passed his engine he noticed it come to a sudden stop, with the caboose about five car-lengths west of where his own engine was standing. Engineman McKnight stated that in his opinion the speed of train D-3 was about 45 to 50 miles per hour when it passed him, and said that from where his own engine stood, it looked as though a clear-restricting indication was displayed for that train, the only thing unusual he noticed about train D-3 was the excessive speed at which it was traveling for a crossover movement with that type of engine. Conductor Geddes, of the wire train, said that while he would not endeavor to make an estimate as to the speed of train D-3 when it passed, yet he thought it was going pretty fast for a crossover movement. Brakeman Sopp also stated that train D-3 passed at a high rate of speed, with the engine working steam, and that a clear-restricting indication was displayed before that train arrived.

Measurements taken of the superelevation of the outside rail of the curve, and the gauge, for a considerable distance east of the crossover switch showed them to be practically uniform. The first mark of derailment was where a flange had mounted the north switch point at a point 4 feet 2 inches west of its receiving end. The first mark on the south rail was a flange mark on a spike head, on the outside of this rail, at a point 42 feet 9 inches west of the switch point, this was at the first point where the tread of a wheel could have dropped between the south running rail and the lead rail of the turnout, and there was a corresponding mark on a tie on the opposite side of the track. Marks continued along both rails of track 4 until the frog was reached beyond which point the track was torn up.

Engine 1695 is of the 2-8-2 type, class L1s, with a driving-wheel base of 17 feet 3 inch, and a weight of 330 000 pounds. This engine was turned out of the Juniata shops, after receiving class 4 repairs, on January 31, 1930. On March 28, 1930, this engine was reported in need of repairs to the extent that the right No. 1 engine truck wheel had a sharp flange, but on inspection this wheel was not condemned, on the following day, a report was made that the engine was nosing badly, with the flange cutting on the right engine-truck wheel, but inspection again developed that repairs were not necessary. Inspection of the engine subsequent to the accident developed that the driving wheels, trailers, boxes and rods were all in good condition, the right engine-truck wheel was cutting and worn, but was not down to the danger point for the maximum

speed permitted in freight service.

The distance from Holmes Block Station to Ford Block Station is 6.8 miles, while the maximum authorized speed for freight trains on the Philadelphia Terminal Division is 40 miles per hour. According to the record, train D-3 passed Holmes at 11.44 p. m. and was derailed at Ford at 11.48 p.m., four minutes being consumed in covering this distance, or at an average speed of 57.6 miles per hour, while the train used only 30 minutes from SU to Ford, a distance of 32.6 miles, or an average speed of 45.2 miles per hour.

Conclusions

This accident was caused by the failure of Engineman Hagan, of train D-3, properly to obey signal indications in controlling the speed of his train when passing through the crossover leading from tracks 4 to 3.

Under the rules, when an approach-restricting indication is displayed a train must approach the next signal at not exceeding one-half its maximum authorized speed at point involved, but not exceeding 30 miles per hour, and when a clear-restricting indication is displayed, a train must proceed at not exceeding one-half its maximum authorized speed at point involved, but not exceeding 30 miles per hour. An approach-restricting indication was displayed by the distant signal over track 4 on signal bridge 106N, while a clear-restricting indication was displayed by the home signal over track 4 on bridge 94N. Engineman Hagan should have reduced the speed of his train accordingly when approaching the crossover, in obedience to these signal indications, and not have exceeded a speed of one-half the maximum authorized speed of his train in this territory, which would have required him to reduce it to 20 miles per hour. As it is, however, the indications are that the speed of his train was far in excess of that permitted. Why he did not properly control the speed of his train is not known, as he was killed in the accident.

Engineman Hagan entered the service of this railroad on July 17, 1901, was made fireman on March 12, 1903, and promoted to engineman on November 23, 1913. At the time of the accident none of the employees involved had been on duty in violation of any of the provisions of the hours of service law.

Respectfully submitted,

W.P. BOPLAND,

Director.