

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE
INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON
THE CENTRAL VERMONT RAILWAY NEAR BURLINGTON, VT.,
ON JULY 23, 1925.

December 31, 1925.

To the Commission:

On July 23, 1925, there was a head-end collision between a work train and a freight train on the Central Vermont Railway near Burlington, Vt., resulting in the injury of two employees.

Location and method of operation.

This accident occurred on that part of the Northern Division extending between Burlington and Cambridge Junction, Vt., a distance of 33.8 miles, this being a single-track line over which trains are operated by time-table and train orders; there is a tunnel about 1 mile north of the station, train movements through this tunnel being protected by automatic signals of the one-arm, two-position, upper-quadrant, semaphore type. This tunnel is 341.2 feet in length, and the accident occurred at a point 34.3 feet north of its north portal.

There are some signals at the approaches to the tunnel which work in conjunction with each other; there are no distant signals. Signal 1, governing northbound movements through the tunnel, is located 486.5 feet south of the south portal; the normal position of signal 1 is clear, and the time interval required for it to change to stop is 5 seconds. Signal 2, governing southbound movements through the tunnel, is located 1,387 feet north of the north portal of the tunnel; the normal position of signal 2 is stop, and the time interval required for it to change to the proceed position is 14 seconds. When a southbound train enters upon the track circuit, which begins at a point 2,348.5 feet north of signal 2, the indication of this signal changes from stop, its normal indication, to proceed, while the indication of signal 1 changes from proceed, its normal position, to stop. When a northbound train enters upon the track circuit, beginning at a point 5.9 feet south of signal 1, the indication of this signal changes from proceed to stop, and the indication of signal 2 remains at stop. In the event a northbound train passes signal 1 while it is displaying a stop indication, caused by an opposing train having entered upon the track circuit from the north and occupying the track between that point

and signal 2, the indication of signal 2 will then change from proceed to stop.

Approaching the point of accident from the north the track is tangent for a distance of 3,344.5 feet, followed by a compound curve to the left 3,309.3 feet in length, the curvature varying from 4° to $40^{\circ} 45'$, the accident occurring on this curve at a point 1,394 feet from its northern end, at which point the curvature is at its minimum. Approaching from the south there are 162.7 feet of tangent, followed by the curve on which the accident occurred. The grade for southbound trains is descending for a considerable distance, level for 700 feet, and then 1.26 per cent ascending for a distance of approximately 750 feet to the point of accident, while the grade for northbound trains is 1.10 per cent ascending for a distance of 1,700 feet to the south portal of the tunnel, then level for a distance of 300 feet, almost to the north portal of the tunnel, then 1.26 per cent descending for a distance of 75.8 feet to the point of accident.

A clear view of signal 2 can be had from the engine-man's side of a southbound engine for a distance of at least 2,350 feet, but the engineman's view of signal 1 was limited in this particular case to 150 feet, owing to the curvature and the fact that the engine was being operated backing up, placing the engineman on the outside of the curve.

The weather was clear at the time of the accident, which occurred at about 1.15 p.m.

Description

Southbound freight train extra 454 consisted of nine cars and a caboose, hauled by engine 454, and was in charge of Conductor Allen and Engineman Couture. At Essex Junction, 7.85 miles north of Burlington, the crew received copy of train order No. 47, Form 19, reading as follows:

"Eng 454 run extra Essex Jet to Burlington"

This order was made complete at 11.19 a.m., and the clearance card, Form 350-B, accompanying it, signed by the operator, was timed at 11.46 a.m. Extra 454 departed from Essex Junction at 12.05 p.m., performed work en route, and arrived at Winooski, 4.94 miles beyond, at 1 p.m. It departed from Winooski, the last open office, at 1.09 p.m., without receiving any orders concerning work extra 394, passed signal 2, which apparently was displaying a stop indication, and collided with work extra 394 while traveling at a speed estimated

to have been between 8 and 15 miles an hour.

Northbound work extra 394 consisted of 11 flat cars, hauled by engine 394, backing up, and was in charge of Conductor Jarvis and Engineman Ryder. At Burlington the crew received copy of train order No. 55, Form 31, together with a clearance card, the order reading in part as follows:

"C&E eng 394 and all extras north. Eng 394 work 100 pm until three fifteen 315 pm between Burlington and one and one half $1\frac{1}{2}$ miles north of Winooski protecting against extra 454 south after 130 pm and protect against extra 209 south after two 200 pm and will not protect against other extras."

This order was repeated at 12.59 p.m. and made complete at 1 p.m. Extra 394 departed from Burlington at 1.10 p.m., passed signal 1, which was displaying a stop indication, and collided with extra 454 while traveling at a speed estimated to have been between 4 and 5 miles an hour.

Both engines were derailed, as was one car in the work train, while the tender of engine 394 was demolished.

Summary of evidence

Engineman Couture, of extra 454, stated the only order he held on leaving Essex Junction was copy of train order No. 47, Form 19, previously quoted. When his train entered on the track circuit north of the tunnel he saw the indication of signal 2 change from stop to proceed, and he said he continued to watch the signal until he got almost to it and that during this time it remained in the proceed position. Just after passing signal 2 he worked steam slightly owing to the ascending grade and also in order to permit the train to drift through the tunnel. On account of the curve he did not see Conductor Jarvis and Head Brake-man Mable, of the work train, running out of the tunnel toward his train, nor did he see the tender of the work train engine, until it was about 50 or 60 feet from his engine. At this time Fireman Willet shouted a warning of danger and Engineman Couture immediately shut off steam and applied the air brakes in emergency, reducing the speed from about 12 or 15 miles an hour to about 8 miles an hour at the time of the accident.

Fireman Willet, of extra 454, stated that he also saw the indication of signal 2 change from stop to proceed, and

he estimated the speed of his train to have been about 15 or 17 miles an hour en route toward signal 2. This signal was still displaying a proceed indication when he last noticed it, at which time it was about 300 feet distant, and he said that the first he knew of anything wrong was on seeing the tender of the work train engine emerge from the tunnel.

Conductor Jarvis and Head Brakeman Mable, of work extra 394, together with Section Foreman Bove, were riding on the rear footboard of the tender of engine 394. Section Foreman Bove observed that signal 1 at first displayed a proceed indication, and then the indication changed to stop, when the engine was about 57 feet from the signal, as shown by subsequent measurements. He said he shouted to the crew that the signal was set against them and then got off. Conductor Jarvis also said that the indication of the signal changed to stop when the engine was still about 20 or 30 feet distant and that it was in this position when the engine passed it. After Section Foreman Bove had jumped off, Head Brakeman Mable spoke to Conductor Jarvis about the stop indication displayed but the conductor said the stop indication was caused by their own train entering upon the track circuit. On reaching a point about a car length from the north end of the tunnel, at which time the train was traveling at a speed of about 4 or 5 miles an hour, Conductor Jarvis either heard or saw extra 454 approaching, got off of the footboard and ran ahead to flag the opposing train; he did not know whether or not his flagging signals were answered but when the engine passed him, traveling at a speed of about 15 miles an hour, he heard the air brakes apply in emergency, the accident occurring immediately afterwards. Conductor Jarvis further stated that there was a doubt in his mind as to whether or not he was right or wrong in passing the stop signal, and that he did not know the exact location of the point of contact for the track circuit for signal 1. The statements of Head Brakeman Mable practically corroborated those made by Conductor Jarvis.

Engineman Ryder, of extra 394, stated that on reaching a point about 30 feet south of signal 1 a proceed indication was displayed and as the engine got closer to the signal it moved down slowly to the stop position. On reaching a point about three car-lengths north of the signal he heard Section Foreman Bove shouting, shut off steam and almost brought the work train to a stop, at the same time asking Fireman Wells why the section foreman was shouting, to which the fireman replied that it was on account of the stop indication displayed. Engineman Ryder stated that he then said to Fireman Wells, "It is supposed to be down, isn't it?", and he thought the fireman nodded his head affirmatively. He then began

to work steam again, as he wanted to reach Winooski before 1.30 p.m., and on reaching a point near the north end of the tunnel he heard Conductor Jarvis shout, and thinking that some one had fallen from the tender footboard he applied the air brakes in emergency, the collision occurring immediately afterwards. Fireman Wells stated that he had just finished putting in a fire when he heard Section Foreman Bove shout; and after he had called the engineman's attention to the section foreman's warning the engineman explained that the signal had operated as it was designed to operate. The first he knew of anything wrong was on reaching a point near the north end of the tunnel, traveling at a speed of about 5 miles an hour, at which time he saw extra 454 approaching, about three or four car-lengths distant.

The statements of Dispatcher Naylor were somewhat conflicting in their details, but apparently he issued train order No. 47 to the crew of extra 454 at Essex Junction at 11.19 a.m., and when he was asked at about 12.45 p.m. to issue an order for extra 394 he forgot that he had issued running orders to the crew of extra 454 and therefore issued train order No. 50 without first getting in communication with the crew of extra 454. Later on, however, he apparently remembered extra 454, for he stated that he called the operator at Winooski and told the operator to let him know when extra 454 approached that point; even at this later time, however, it did not occur to him that the orders had not been properly issued to the trains involved. Dispatcher Naylor also stated that he did not receive a report from the operators at Essex Junction and Winooski concerning the movement of extra 454 until after the accident had occurred.

The statements of the operator at Winooski brought out nothing additional of importance except that he said the dispatcher had inquired of him concerning extra 454 and that when the train arrived he reported its arrival to the dispatcher. He also said that he reported the departure of the train at the time it actually departed, but received no reply from the dispatcher, and at 1.20 p.m. he gave the dispatcher both the arriving and departing times of the train in question.

Conclusions

This accident was caused by the failure of Dispatcher Naylor properly to issue a train order, and by the failure of Engineman Couturo, of extra 454, and Engineman Ryder and Conductor Jarvis, of extra 394, properly to observe and obey automatic signal indications.

The evidence showed that Dispatcher Naylor had issued running orders to the crew of extra 454 and when called upon to issue an order for the movement of work extra 394 he forgot the previous order, the result being that neither crew was aware of the existence of the opposing train until the accident occurred.

It further appeared that extra 454 was the first to reach the track circuit, causing the signal governing the movement of work extra 394 to display a stop indication about one car-length in advance of that train and the signal governing the movement of extra 454 to display a proceed indication. Instead of stopping, however, work extra 394 proceeded, and when it passed the signal, under the circuit arrangement in effect, this caused the signal governing extra 454 to be restored to the stop position. While the location of extra 454 at the time this took place could not be definitely stated, yet a consideration of the signal layout, distances involved, etc., leads to the conclusion that the signal must have been restored to the stop position before it was passed by extra 454, although Engineman Couture made positive statements to the contrary.

Had an adequate automatic train stop or train control device been in use, this accident would have been prevented.

Dispatcher Naylor entered the service of this railway as a relief operator in April 1915, and was promoted to dispatcher in May 1925.

The employees involved were experienced men, and at the time of the accident none of them had been on duty in violation of any of the provisions of the hours of service law.

Respectfully submitted,

W. P. BORLAND,

Director.