INTERSTATE COMMERCE COMMISSION

REPORT NO. 3290

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION REPORTS UNDER THE LOCOMOTIVE INSPECTION ACT OF FEBRUARY 17, 1911, AS AMENDED

ATCHISON, TOPEKA AND SANTA FE RAILWAY

December 23, 1949

Accident at Marceline, Mo., on September 18, 1949, caused by rough stop of train, due to the engineer's foot slipping from the safety control (dead man) pedal.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On September 18, 1949, about 3:20 a.m., at Marceline, Mo., while an Atchison, Topeka and Santa Fe Railway Diesel-electric locomotive was hauling a freight train at an estimated speed of 4 miles per hour, the engineer's foot slipped from the safety control pedal of control unit 101, resulting in sudden stop of the train with heavy run-in of the slack. The conductor who was in the caboose was seriously injured.

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[1]Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.

DESCRIPTION OF ACCIDENT

On September 18, 1949, an Atchison, Topeka and Santa Fe Railway Diesel-electric locomotive, comprised of units 101, 101-A, and 101-B coupled in multiple unit control, started at Marceline Yards, Marceline, Mo., at about 3:20 a.m., hauling westbound freight train 2/59. Visibility was restricted because of a dense fog. After proceeding for a distance of 10 or 12 car-lengths, and while the train was running at an estimated speed of 4 miles per hour, the engineer partly arose from his seat in the cab of control unit 101 and leaned out the cab window to better observe the signals. While so engaged his foot slipped from the safety control (dead man) pedal which resulted in a train control service brake application and functioning of the pneumatic control switch which slowed the Diesel engines to idling speed. A heavy head end brake application resulted in sudden retardation of the front end of the train and a hard run-in of slack.

The conductor, who was standing near his desk in the caboose, was thrown against a partition and sustained head and eye injuries which subsequently necessitated removal of the injured eye. The rear brakeman, who was seated at the desk, was thrown to the floor of the caboose but was not seriously injured.

The train consisted of 104 cars (88 loads and 16 empties) and a caboose, 4246 tons. The track grade approaching the point of the accident was undulating.

DESCRIPTION OF LOCOMOTIVE UNITS

Atchison, Topeka and Santa Fe Diesel-electric locomotive units 101, 101-A, and 101-B were built by the Electro-Motive Corporation at La Grange, Ill., in March 1941. Each was equipped with a 567-A, 16-cylinder, 2-cycle, 1350-horsepower Diesel engine with direct connected generator. Each unit was mounted on two four-wheel trucks, each axle of which was individually gear connected to a driving motor. The weight on driving wheels of control unit 101 was 231,700 pounds and on units 101-A and 101-B, 230,100 pounds each. Total tractive effort of the three units was 173,100 pounds. The units were equipped with Westinghouse No. 8 ET brake equipment designed for coupler connected units. Control unit 101 was equipped with KS-8-PA automatic brake valve, train control, maximum speed governor control, and safety control feature.

DESCRIPTION AND EXAMINATION OF PARTS INVOLVED

The safety control feature effects a train control service brake application in the event the engineer's foot leaves the control pedal. It includes a diaphragm foot valve connected in the safety control air pipe line and a pedal (commonly referred to as dead man pedal), 3/16 inch thick, slightly roughened on its face, 6-1/4 inches in width, 2-3/4 inches in length or depth, and a tapered connection to the diaphragm foot valve. With the foot valve pedal held down the brake application is suppressed. A diaphragm cut-off valve is provided which operates to suppress a control brake application, permitting release of the pedal when the locomotive brake is applied with a predetermined pressure of 35 pounds. A cut-out cock is also provided to cut the feature out if desired.

The application valve portion of the KS-8-PA brake valve functions to provide a service brake application as initiated by the safety control system (also by the train control devices and the maximum speed governor). Normally the piston of the application valve is held in release position by a spring which is balanced by main air reservoir pressure. When the air pressure on top of the piston is reduced by a safety control application through release of the pedal, the differential in pressures moves the piston and its attached slide valve to application position. In this position, the ports in the slide valve register with various passages and chambers which results in the reduction of brake pipe air pressure and application of the brakes.

The safety control pedal on unit 101 was located on the cab deck, 11-1/2 inches in front and 4-1/2 inches to the left of the center line of the engineer's seat and 23-3/4 inches from the side wall of the cab, which is in conformity with the carrier's standard for this type of locomotive. The standard size pedal was worn smooth and slightly tapered. To prevent slippage of the operator's foot, ridges had been built up by bronze fusion welding on the outer edges of the pedal to a height of 3/16 inch and width of 5/16 inch. The ridges were smooth on top and inner walls were slightly rounded.

The pneumatic control switch was located on the right cab wall just to the rear of the engineer's seat. When this switch is tripped it automatically slows the main Diesel engines to idling speed and shuts off all fuel pumps. The switch is operated by air pressure on a diaphragm having normally closed contacts set to open at 40 pounds pressure and close at 20 pounds pressure, and is returned to normal position by spring pressure. After it has operated, a lock-out button holds the switch contacts open until

reset manually by a reset button provided. The air portion of the switch is connected through piping to the application portion of the brake valve. In safety control and emergency automatic train control brake applications, main air reservoir pressure is communicated to its operating diaphragm, opening the normally closed contacts of the switch through electric relay provided. The breaking of the circuit de-energizes the "ER" (throttle) relay and causes it to drop out, reducing the speed of the Diesel engines to idling instantly and thereby reducing the electrical power. Also the opening of the circuit causes the magnetic fuel pump switches to open at each Diesel engine, thus shutting off the fuel pumps and stopping the engines when the fuel in the lines is depleted.

INSPECTION AND REPAIR REPORTS

The last monthly inspection of unit 101 was made August 29, 1949, at Cleburne, Tex. All trip inspection reports for the 30 days preceding the accident, on file at Kansas City, Kans., and Fort Madison, Iowa, were examined and nothing was found reported that would have any bearing on the accident.

SUMMARY OF EVIDENCE

The engineer stated in substance that as the train was pulling out of the yard he raised up and leaned out the cab window in an effort to see switch lights and pot signals better in the fog, and in doing so his foot slipped off the dead man pedal and before he could get his foot back on the pedal and lap the brake valve a service application of 20 pounds brake pipe pressure had been made and the train had stopped. He stated the entire train had been moved about 10 or 12 car-lengths and was moving at about 4 miles per hour at the time his foot slipped from the pedal; that the throttle was in Run 3 position and the transition lever in No. 1 or series position, and that the pneumatic control switch functioned instantly bringing the Diesel engines to idle. He stated that his fireman was back in the engine compartment and knew nothing of the occurrence. He also stated that another conductor was provided and the train then proceeded to Kansas City, Kans., without further unusual incident.

The rear brakeman stated in substance that the train started about 3:20 a.m. and had moved about 10 car-lengths before the conductor came into the caboose; that he (rear brakeman) was sitting at the desk when the conductor came in and stood near him when a sudden stop occurred knocking him (brakeman) from the

chair to the floor. When he got up he observed the conductor sitting on the bunk and he was bleeding about the left eye. His glasses were on the floor with the left lens shattered. He (brakeman) opened the tail hose valve and left the caboose to advise the yardmaster of the accident.

The injured conductor corroborated the brakeman's statement and added that he thought he was thrown by the severe shock and that his head struck the steel partition post, but that he was knocked out for an instant and could not state just what happened. He stated his glasses were broken and the left lens cut his eye. He estimated the speed of the train to be about 4 miles per hour.

DISCUSSION

Investigation indicated that the safety control feature and the pneumatic control switch functioned as intended when the engineer's foot slipped from the safety control or dead man pedal and, due to the slow movement of the train, there was not sufficient time before the train stopped for the engineer to suppress or release the safety control service brake application by replacing his foot on the pedal and lapping the automatic brake valve. The combination of the slow movement, the undulating grade, the sudden reduction of electrical power, the heavy head end brake application, and the length of the train, resulted in a hard run-in of slack as the train stopped.

During the investigation, tests were made to determine the probable position of the engineer's foot on the pedal when he leaned out the cab window. It was found that when a person of average height leaned out the window the ball of the left foot would roll and rise from the outer edge of the pedal, a distance of 1/2 inch to 1-3/4 inches, and that the arrangement provided by the carrier by building up the edges of the pedal to prevent the operator's foot from slipping off was ineffectual. In fact, should the foot be turned slightly either angular or crosswise on the pedal while leaning out the cab window, the tendency to slip was increased.

RECOMMENDATION

Means whereby the foot of the engineer or other person operating a locomotive of the type involved in the accident is adequately protected against slippage on or from the safety control (dead man) pedal should be provided by the Atchison, Topeka and Santa Fe Railway Company in order that repetition of this type of accident may be avoided.

CAUSE OF ACCIDENT

It is found that this accident was caused by rough stop of the train, due to the engineer's foot slipping from the safety control (dead man) pedal while he was leaning out the cab window.

Dated at Washington, D. C., this 23rd day of December, 1949.

By the Commission, Commissioner Patterson.

SEAL

W. P. BARTEL,

Secretary.