

RAILROAD ACCIDENT INVESTIGATION

Report No. 4117

THE CHESAPEAKE AND OHIO RAILWAY COMPANY

FIRE CREEK, W. VA.

MARCH 15, 1967

DEPARTMENT OF TRANSPORTATION
Federal Railroad Administration

Washington, D. C.

Summary

DATE: March 15, 1967

RAILROAD: Chesapeake and Ohio

LOCATION: Fire Creek, W. Va.

KIND OF ACCIDENT: Derailment

TRAIN INVOLVED: Passenger

TRAIN NUMBER: 1

LOCOMOTIVE NUMBERS: Diesel-electric units 4001,
4011, 4027

CONSIST: 16 cars

SPEED: 47 m.p.h

OPERATION: Signal indications

TRACKS: Double; 2°15' curve; 0.1 percent
descending grade westward

WEATHER: Raining

TIME: 2:05 a.m.

CASUALTIES: 22 injured

CAUSE: Landslide

RECOMMENDATION: That the Chesapeake and Ohio
Railway Company install a slide
detector fence on the north side
of the main tracks in the area
at Fire Creek where landslides
have occurred on several occa-
sions during unfavorable weather
conditions

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
RAILROAD SAFETY BOARD

RAILROAD ACCIDENT INVESTIGATION
REPORT No. 4117

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
MARCH 15, 1967

Synopsis

On March 15, 1967, a Chesapeake and Ohio Railway Company passenger train derailed at Fire Creek, W. Va., resulting in injury to 10 passengers and 12 employees

The accident was caused by a landslide.

Location and Method of Operation

The accident occurred on that part of the Hinton Division extending between Hinton and Handley, W. Va., a distance of 72.5 miles. In the accident area this is a double-track line over which trains operate in either direction on both main tracks by signal indications of a traffic control system. From the north, the main tracks are designated as No. 1 and No. 2.

The derailment occurred on track No. 1 at Fire Creek, 37.8 miles west of Hinton and 4.1 miles west of Thurmond.

In the derailment area, the main tracks are laid in a

side-hill cut and adjacent to the north bank of the New River.

Automatic signal 3941-1, governing westbound movements on track No. 1, is 4,503 feet east of the derailment point.

Details concerning the tracks, landslide area, carrier's operating rules, train, damages and other factors are set forth in the appendix.

Description and Discussion

During the 30-day period preceding the accident, heavy rainfalls occurred in the territory involved

No. 1, a westbound first-class passenger train consisting of 3 diesel-electric units and 16 cars, left Hinton at 12:08 a.m. the day of the accident and proceeded westward under rainy weather conditions. At Prince, 22.9 miles west of Hinton, the crew members received copies of train order No. 1, which instructed them to be on the alert for possible landslides at four known trouble areas. At Thurmond, the crew members received a message warning them of another trouble area. None of the areas mentioned in the train order and message was near the point where the derailment occurred.

No. 1 left Thurmond at 1:58 a.m., 1 hour 13 minutes late. Soon afterward, while moving westward on track No. 1, it passed signal 3941-1, which displayed a Clear aspect, and entered a 2°15' curve to the left at Fire Creek. The fireman, a qualified engineer was at the locomotive controls. About 2:05 a.m., as the train moved on the curve at 47 miles per hour, as indicated by the speed-recording tape, both engineers saw that track No. 1 was obstructed by a landslide about 300 feet ahead. The fireman applied the train brakes in emergency. Immediately thereafter, before train speed was materially reduced, No. 1 struck the landslide, derailing the three locomotive units and the 1st to 8th cars, inclusive.

The engineer, fireman, conductor, 4 dining-car employees, 1 train porter, 3 sleeping-car employees, 1 railway post office employee, and 10 passengers were injured.

Examination of the track structure disclosed that the train had been derailed by a landslide from the hill on the north side of the main tracks. The structure of both main tracks was destroyed or heavily damaged in the landslide area as a result of the derailment. The landslide debris obstructing track No. 1 was composed of mud, small boulders, and a tree about 11 inches in diameter. A boulder weighing about 200 tons was wedged under the north side of track No. 1, causing the ties and rails to be raised considerably and the track moved out of line about three feet to the south.

Examination of the hillside revealed the landslide originated in a 1/3-acre area located 145 to 300 feet from track No. 1. This area is 175 to 300 feet above the tracks, and lies below a coal strip-mining operation on top the hill.

Weather records for a point 15 miles southwest of the derailment area revealed that 6.82 inches of rain had fallen during the 30-day period preceding the derailment. During the two days immediately preceding the derailment, rainfall totaled 2 07 inches.

Three trains passed Fire Creek between 3 hours 20 minutes and 1 hour 45 minutes prior to the derailment. The crew members stated that it was raining heavily in the derailment area, and that they noticed no unusual condition of the track or the adjacent terrain.

The last inspection of the hillside at the derailment point was made by the carrier's Bluff Inspector on February 6, 1967. He did not notice any unusual condition. Because of heavy rains the track was last patrolled in the slide area at 5:25 p.m. the day before the accident by a maintenance-of-way official. He took no exceptions to conditions at this point.

The carrier has no record of any landslide occurring in the derailment area before January 1965, when two small slides occurred 220 feet east and 330 feet west of the derailment point. These slides were accumulations of mud, which washed down the hillside from the coal strip-mining operation at the top of the hill. On these occasions, the carrier posted watchmen at the base of the hillside until the slide conditions subsided. Since that time, small amounts of mud from the strip-mining operation have washed down the hillside to the ditch line along the north side of track No. 1 during heavy rainfalls.

Between Hinton and Handley there are six track areas protected by slide detector fences, two areas protected by bluff protection wires, and four areas protected part time by bluff watchmen.

Findings

The coal strip-mining operation on top the hill north of the derailment point apparently has disrupted the normal drainage pattern for the hill. In the instant case, drainage from heavy rains saturated approximately one-third acre of ground on a 37-degree slope of the hill to the extent that the surface of this land area lost cohesiveness and started to slide down the hill. The landslide cascaded over a 60-foot bluff and moved down a 40-degree slope to the drainage ditch along the north side of the main tracks. Some of the slide debris overflowed onto track No. 1 and a large boulder, which apparently had fallen from the 60-foot bluff, wedged itself under the north side of that track causing the ties and rails to heave upward and be displaced. The slide occurred sometime within a period of 1 hour 45 minutes after passage of the last previous train and the time No. 1 approached Fire Creek on track No. 1 and did not affect the circuits of the wayside signal system. Signal 3941-1 displayed a Clear-Aspect as No. 1 approached it at 47 miles per hour and it is evident that neither enginemen saw the slide obstructing track No. 1, or saw that the track

was displaced in the slide area, in sufficient time to reduce speed before the derailment.

A slide detector fence located on the slope on the north side of the track, and so arranged as to actuate the signals to their most restrictive aspects if struck or moved by falling rocks or slides, possibly would have averted this accident.

Cause

This accident was caused by a landslide.

Recommendation

It is recommended that the Chesapeake and Ohio Railway Company install a slide detector fence on the north side of the main tracks in the area at Fire Creek where landslides have occurred on several occasions during unfavorable weather conditions.

Dated at Washington, D. C., this 25th
day of October 1967.
By the Federal Railroad Administration,
Railroad Safety Board

Bette E. Holt
Acting Executive Secretary

(SEAL)

Appendix

Tracks

From the east on track No. 1 there are, in succession, a tangent 1,174 feet, a 2°00' curve to the left 1,346 feet, a tangent 1,043 feet, a 4°40' curve to the left 1,157 feet, a tangent 200 feet, and a 2°15' curve to the left 788 feet to the derailment point and a short distance westward. In this area the grade for westbound trains is 0.1 percent descending 1 1 miles to the derailment point

The track structure in the derailment area consists of 132-pound rail, 39 feet long, laid new in 1955 on an average of 22 treated ties per rail length. It is fully tieplated with double-shoulder tie plates, spiked with 2 rail-holding and 1 plate-holding spikes per tie plate, and is provided with 6-hole 36-inch joint bars and an average of 12 rail anchors per rail. It is ballasted with limestone to a minimum depth of 12 inches below the ties

Landslide Area

The base of the hillside north of the main tracks at the derailment point is 10 feet from the centerline of track No. 1 and about 12 inches below the bottoms of the rails. From its base, the hillside extends upward at an angle of about 40 degrees to a point 145 feet north and 115 feet above track No. 1. Upward from this point, the hillside forms a vertical bluff 60 feet high. From the top of the bluff, the slope extends upward at an angle of about 37 degrees, to a point 300 feet north and 300 feet above track No. 1. The landslide originated on the 37-degree slope. Above the area where the slide originated, the hillside continues to rise at various slopes to its top, which is 200 feet north of track No. 1. A coal strip-mining area is at the top of the hill.

Carrier's Operating Rules

Maintenance of Way Foreman

1659. During heavy storms or abnormal weather conditions *** they and the necessary trackmen must remain on duty as long as may be necessary ***

The Foreman must detail to each trackman a definite portion of the road to patrol, ***

Foreman must see that each trackman is provided with proper flagging signals and instruct him as to their use. They must see that each trackman carefully patrols the portion of road assigned to him, inspecting the track, bridges, culverts, embankments, slopes of cuts, *** Sharp lookout must be kept for evidence of washing out of the ballast and road-bed under the tracks, *** the sliding in of earth and rock from slopes *** in case of any defect to the track or structure not safe for maximum speed, flag protection must be immediately provided.

Train

No. 1 consisted of car-body type diesel-electric units 4001, 4011, and 4027, coupled in multiple-unit control, 1 mail car, 1 baggage car, 3 sleeping cars, 2 coaches, 1 dining car, 2 sleeping cars, 2 coaches, 2 sleeping cars, 1 business car and 1 baggage car, in that order. The cars were of all-steel construction. The 3rd to 15th cars, inclusive, were equipped with tightlock couplers.

As the train approached the derailment point, the engineer and fireman were in the control compartment at the front of the first diesel-electric unit. The fireman was operating the locomotive. The other crew members were at various locations in the cars. The train brakes had been tested and had functioned properly. The headlight was lighted.

Damages

The train stopped with the front end 334 feet west of the derailment point. The 3 locomotive units and the first 8 cars were derailed. They stopped upright on or near the track structure as indicated in the sketch appended to this report. Separations occurred at both ends of the 2nd and 3rd cars. The three diesel-electric units were heavily damaged. Of the derailed cars, 2 were destroyed, 4 were heavily damaged, and 2 were slightly damaged.

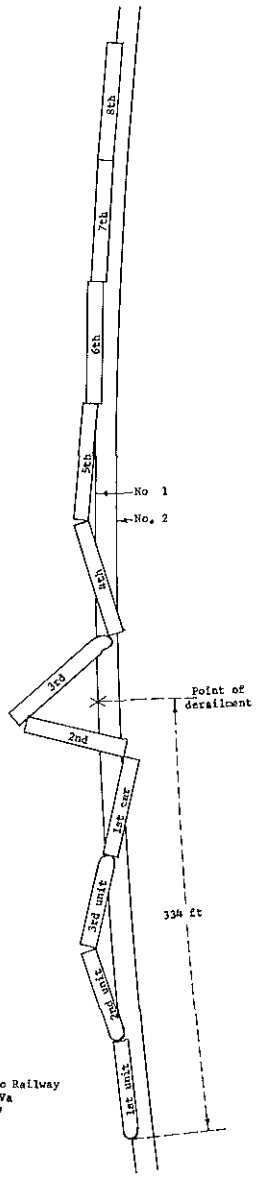
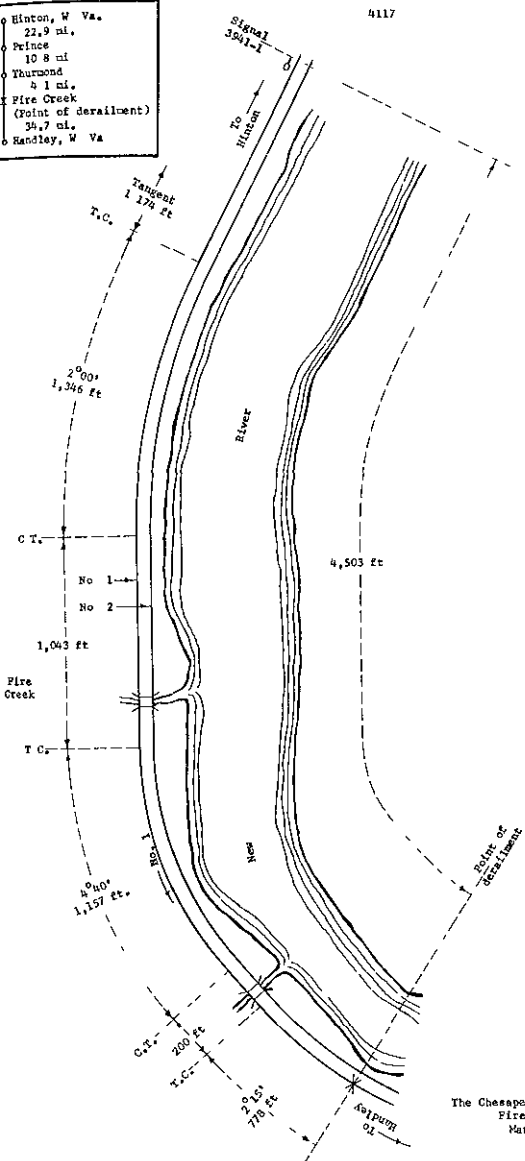
Other Factors

The accident occurred at 2:05 a.m., under rainy weather conditions.

The maximum authorized speed for passenger trains in the derailment area is 50 miles per hour.

- Hinton, W Va.
- 22.9 mi.
- Prince
- 10.8 mi
- Thurmond
- 2.1 mi.
- Fire Creek
- (Point of derailment)
- 34.7 mi.
- Handley, W Va

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