

INTERSTATE COMMERCE COMMISSION
WASHINGTON

REPORT OF THE DIRECTOR
BUREAU OF SAFETY

ACCIDENT ON THE
DULUTH, SOUTH SHORE AND ATLANTIC RAILWAY

MICHIGAMME, MICH.

MARCH 30, 1939

INVESTIGATION NO. 2341

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SUMMARY

Inv-2341

Railway:	Duluth, South Shore and Atlantic
Date:	March 30, 1939
Location:	Michigamme, Mich.
Kind of accident:	Derailment
Train involved:	Passenger
Train number:	10
Engine number:	704
Consist:	5 cars
Speed:	30 m. p. h.
Operation:	Timetable and train orders
Track:	2° curve to the left; grade practically level
Weather:	Clear
Time:	7:18 p. m.
Casualties:	2 killed
Cause:	Landslide

Inv-2341

May 4, 1939.

To the Commission:

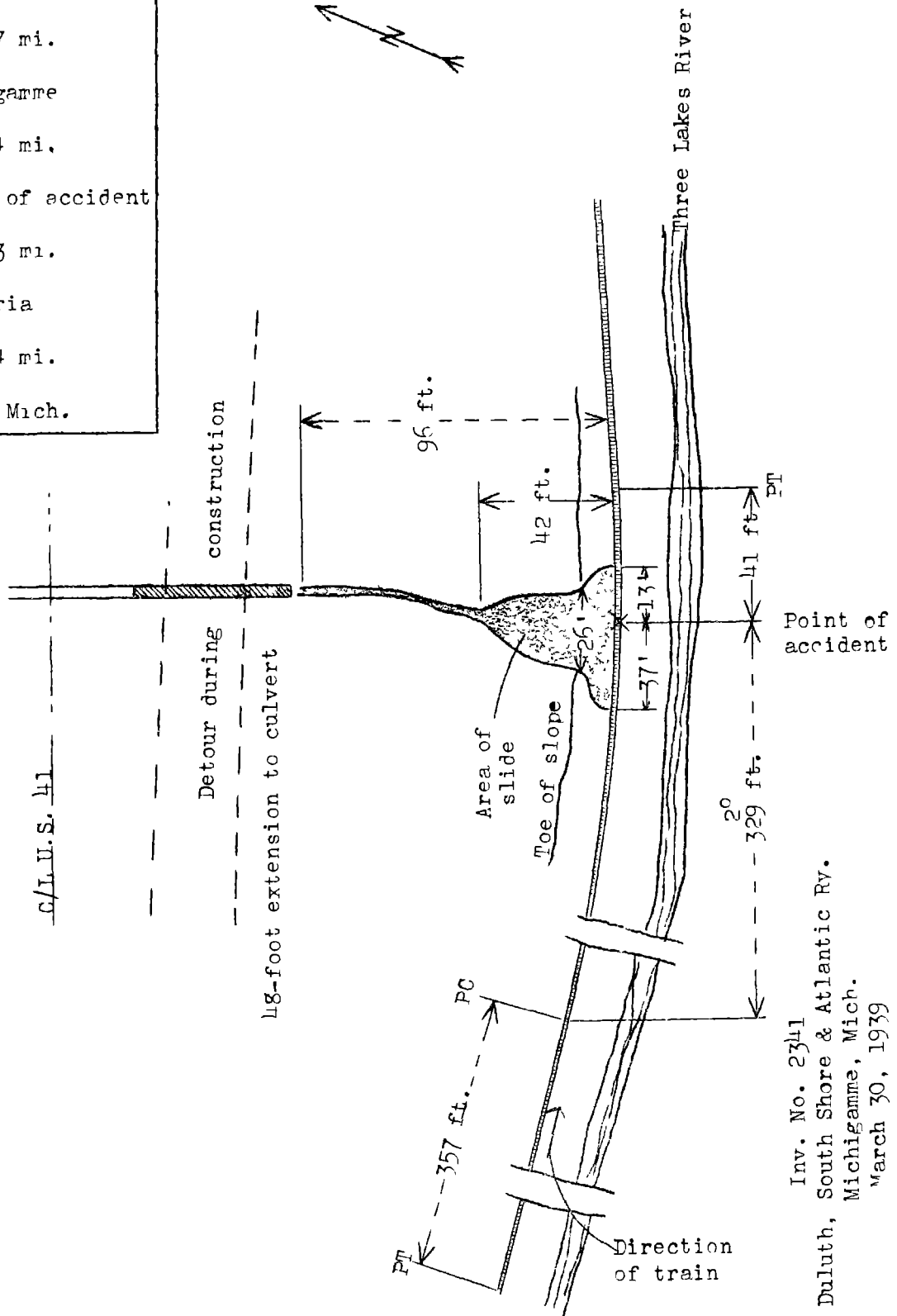
On March 30, 1939, there was a derailment of a passenger train on the Duluth, South Shore and Atlantic Railway near Michigamme, Mich., which resulted in the death of two employees.

Location and Method of Operation

This accident occurred on the Second Subdivision which extends between Ewen and East Yard, Mich., a distance of 100.8 miles. In the vicinity of the point of accident this is a single-track line over which trains are operated by timetable and train orders, no block-signal system being in use. The derailment occurred at a point 3.4 miles west of Michigamme. Approaching from the west there is a tangent 357 feet in length, followed by a 2° curve to the left which extends 329 feet to the point of derailment and 41 feet beyond. The grade is practically level. Visibility from the right side of an east-bound engine was somewhat restricted by the curve on which the accident occurred.

In the immediate vicinity of the point of derailment the track is laid through a hill-side cut about 150 feet in length. To the north side of the track a slope, the toe of which is 5 feet from the center-line, rises to a height of 44 feet at a point 110 feet from the track, or at a ratio of 2 to 5. The formation is composed of a mixture of rock, clay, sand, and gravel, the surface of which is covered with grass and brush. U. S. Highway No. 41 is located at the top of the slope and parallels the track, its center-line being 175 feet north of the center-line of the track. A detour road had been built by a construction company between the rim of the slope and U. S. Highway No. 41 for use during the reconstruction of the latter road. Before the detour road was built an 18-inch culvert under the highway provided drainage from a hill and a marshy basin on the north to a ditch paralleling the highway on the south side. A 48-foot extension to this culvert was installed under the detour road, resulting in its outlet being located about 96 feet from the center-line of the track and causing the drainage to be diverted to the slope toward the track and Three Lakes River which is located to the south of the track. The north bank of the river is from 10 to 50 feet from the roadbed.

o	East Yard, Mich.
	38.7 mi.
o	Michigamme
	3.4 mi.
X	Point of accident
	4.3 mi.
o	Nestoria
	54.4 mi.
o	Ewen, Mich.



Inv. No. 2341
 Duluth, South Shore & Atlantic Ry.
 Michigamme, Mich.
 March 30, 1939

The track structure at the point of accident consists of 80-pound rail, 33 feet in length, laid on 19 hemlock ties to the rail length; it is double-spiked on the inside and single-spiked on the outside, fully tieplated, ballasted with 10 to 12 inches of gravel with 10 inches of stamp sand below the tops of the ties, and is fairly well maintained.

Bulletin No. 24, dated January 28, 1939, reads as follows:

"In connection with reconstruction of U. S. Highway No. 41 between Michigamme and Three Lakes there will be considerable blasting in removing rock. As the highway is close to the track at numerous places where blasting operations will be carried on there is a possibility that rock will be blown on the track.

"Blasting operations will commence in the very near future and will continue for two or three months. Trains operating through this district will be on the alert and expect to be stopped by flags in either direction until this work is completed."

The maximum authorized speed for passenger trains with Class F-3 engines is 40 miles per hour.

The weather was clear at the time of the accident, which occurred about 7:18 p. m.

Description

No. 10, an east-bound passenger train, consisted of one mail-express car, one baggage car, one coach, one Pullman sleeping car and one refrigerator car, in the order named, the first four cars being all-steel construction and the fifth car wood construction, hauled by engine 704, a class F-3 of the 2-8-0 type, and was in charge of Conductor Pigott and Engineer Richardson. This train departed from Nestoria, the last open office and 4.3 miles west of the point of accident, at 7:08 p. m., according to the train sheet, 2 minutes late, and, after entering the cut involved a distance of approximately 113 feet, it struck a landslide and was derailed while traveling at a speed estimated to have been 30 miles per hour.

The engine, badly damaged, stopped almost entirely submerged in the river, with its front end 123 feet east of the point of derailment, parallel to and about 42 feet from the track. The tender, also badly damaged, stopped behind and at right angles to the locomotive, with the rear end of its cistern on the roadbed. The first car was badly damaged and was derailed to the south with its forward portion leaning against the rear of the tender. The second car, slightly damaged and remaining coupled to the first car, was derailed but remained in upright position and in line with the track. The leading truck of the third car was derailed. All the derailed equipment stopped within a distance of 236 feet, and the track was damaged a distance of 198 feet. The employees killed were the engineman and the fireman.

Summary of Evidence

Conductor Pigott stated that the air brakes functioned properly en route, and the headlight of the engine was burning brightly at Nestoria. Approaching the point of accident he was in the rear seat of the third car and estimated the speed of the train to have been not in excess of 30 miles per hour which was slower than usual. The first intimation he had of the accident was when the air brakes became applied in emergency, and 2 or 3 seconds later there was a severe jar which seemed as though a heavy object was being pushed, and the train stopped at 7:18 p. m. His examination disclosed that about 100 feet of the track on the north side was torn up and that soil and a considerable amount of rocks covered the track; the accumulation of debris was about 1 inch deep over the rail at the center of the third car. It was his opinion that the snow plow, with which this engine was equipped, had somewhat levelled the debris. He stated that the weather was clear and the visibility good.

The statement of Brakeman De Merse, who was in the front portion of the third car, corroborated that of the conductor as to the movement of the train. He stated that there had been a considerable amount of soil piled on the track which evidently had been thrown toward the river side of the track by the train, leaving about 6 inches of mud over the rails. After the derailment a small amount of soil and water was coming from the bank.

The statement of Baggage man Northery added nothing of importance.

Engineman Quinn, of No. 1, a west-bound passenger train, and the last train through this cut prior to the accident, stated that he left Michigamme at 4:39 p. m., and 5 or 10 minutes later passed the point where the derailment occurred. He observed nothing unusual and there was no indication of a landslide; there was no water running down from the bank.

Trainmaster Schmidt stated that he arrived at the scene of the accident about midnight and observed that the engine had practically passed through the slide before it became derailed, which was at a point where the shoulder between the track and the river bank was about 10 feet wide.

Section Foreman Partanen, who has been assigned to this territory over 4 years, stated that he passed through this cut westward at 8:30 a. m. the day of the accident and, when returning about 2 p. m., observed that the bank, which was covered on top with snow, was still frozen over but wet on the bottom portion from melted snow. He left a man to clean out the drainage ditch on the north side of the track and leading to a 15-inch culvert, the outlet of which is to the river and is located 74 feet east of the point of accident. This sectionman reported back to him at 3:40 p. m. He stated that he arrived at the scene of the accident at 8:20 p. m., and observed that the slide had covered the north rail to a depth of about 1 foot a distance of 28 or 30 feet. Large stones were removed from the north side of the track. Water and sand were coming down the bank and it appeared that the bank was frozen as in the slide there were large chunks of earth and sod which apparently became loose because of being very wet under the surface. The track ditch is cleaned out in the spring of the year to dispose of the water from the embankment which is well grassed. He stated that he never had had any trouble with water or slides in this vicinity. Prior to the accident he had no knowledge of the culvert being under the detour road and discharging water at the point where the slide occurred.

Roadmaster Johnson stated that he has been in charge of this territory about 16 years and no trouble from slides or water had been experienced at this point. The cut had never been disturbed, and with the exception of the point where the slide occurred it is now in the same condition as in the past. The only knowledge he had of water being discharged from the highway to the railroad was in 1932, when contractors diverted water to the track at the same point during the reconstruction of the highway, at which time there was no detour road.

Division Engineer Hamilton stated that late in 1938 the State Highway Department had let a contract to the Hersey Construction Company to reconstruct U. S. Highway No. 41 and State Highway M 28 which are the same route. This work included the straightening of a number of curves, the excavation of a considerable amount of rock, and the lowering of the original grade of the highway about 15 feet in the vicinity of the point of accident; negotiations in connection therewith, insofar as the railroad was concerned, were conducted through his department. The slide occurred at a point where it would not be expected. Measurements made under his supervision after the accident disclosed that the apex of the slide was 42 feet above the base of the rail and the width at the toe of the slope was 26 feet and the track was covered a distance of 13 and 37 feet east and west, respectively, of the point of derailment. His first knowledge of the extension being made to the original highway culvert was after the accident occurred. The outlet of the culvert was covered with snow and was found by the sound of water passing through it. It was customary for the highway department to notify the railroad when they intended to turn water upon its right-of-way. Once since January 1 he had discussed with the highway engineer the manner in which they were disposing of some excavated material, but no mention was made of water being diverted to the railroad.

Maintenance Engineer Whitman stated that he arrived at the point of accident at 1:10 p. m., March 31. There was a snow bank from the right-of-way fence to the end of the extended culvert, at which point a portion of the snow had been removed. He was able to push a rod about 3 feet into the ground near the mouth of the culvert, which indicated that the water had caused the frost to leave the ground at this point, while approximately 5 or 6 feet on either side the ground was frozen and covered with snow. It was his opinion that the warm weather of the previous day had started a run-off from the hills; this water ran under the snow at the culvert where it was held until the frost had left the ground, then it worked into the clay beneath the sod, and the ground, becoming thoroughly saturated, was so heavy that the sod could not hold it any longer and it slipped down upon the track. He was advised by the highway engineer and the construction superintendent that about 4 or 5 p. m., on the day of the accident, some blasting had been done within 200 or 250 feet of the location of the slide and he was of the opinion that this might have had some effect in causing the slide. He discussed the situation with the highway

engineer and arrangements were made immediately to provide other means to dispose of the water. The drainage ditch on the north side of the track had a depth of from 8 to 12 inches below the tops of the ties and was sufficient to take care of the water at that point. His inspection of the track west of the point of derailment disclosed nothing that would contribute to the accident. He was of the opinion that the track was well maintained for the type of trains operated thereon.

Observations of Commission's Inspectors

Observations of the Commission's inspectors at the scene of the accident on April 1 and 3 disclosed conditions to be practically as stated by the railroad employees. On April 3 the snow between the end of the culvert and the railroad right-of-way had disappeared and the course of the water from the point where it was discharged from the culvert to the apex of the slide could be easily followed. The bank in this vicinity was grassed over and there were no indications of other slides having occurred at this point.

Discussion

The investigation developed that a landslide consisting of rocks and large chunks of earth and sod fell from the north side of a hill-side cut and filled the 5-foot space between the wall of the cut and the track a distance of 50 feet. As the engine was equipped with snow flangers, the debris was shoved to each side and levelled somewhat over the rails to a depth estimated to have been from 1 to 6 inches. After the accident it was observed that material continued to come from the embankment and covered the north rail to a depth of about 1 foot.

According to the testimony, the weather was clear and when No. 10 approached the point of accident at a speed estimated to have been 30 miles per hour, the headlight of the engine was apparently burning brightly. The visibility of the engineman was somewhat restricted due to the curve. As the engineman and the fireman were killed in the accident no information could be obtained in regard to when the slide was first observed by them; however, according to the statements of some members of the train crew, after the emergency application of the air brakes was made it was followed in two or three seconds by a severe jar which appeared to have been caused by the train striking a heavy object. This would indicate that there was no warning of the slide until it was too late to avert the accident.

An 18-inch culvert under U. S. Highway No. 41 formerly disposed of the drainage to a ditch on its south side and the track received none of the water. In reconstructing this highway a detour road was built between the highway and the railroad and the culvert was extended toward the railroad a distance of 48 feet, resulting in the water being diverted to the railroad right-of-way. None of the railroad employees had any knowledge of the existence of this extended culvert; therefore, no provisions were made to protect this situation.

On the date of accident the section foreman passed through this cut at 8:30 a. m., and again at 2 p. m.; he observed that the top of the hill-side was covered with snow, which hid the outlet of the culvert, and the bottom portion was frozen over but wet from the melted snow. He arranged to have a section-man clean out the drainage ditch on the north side of the track to protect against this condition. The last train to pass through this cut prior to the accident was a west-bound passenger train between 4:44 and 4:54 p. m., at which time the engineman, who was on the embankment side, noticed nothing unusual or any indications of a landslide, and he observed no water coming down the bank. Because of warm weather a small run-off started from the hills and water passed through the culvert under the snow where it was held until the frost had left the ground, when it seeped into the earth and sod, causing the ground to become thoroughly saturated and the weight increased to such an extent that the sod could no longer hold it. There had been some blasting done in this vicinity on the afternoon of the day of the accident and this may have contributed to the cause of the landslide.

The bank in this vicinity was grassed over, and no trouble had previously been experienced with slides at this location.

Conclusion

This accident was caused by a landslide.

Respectfully submitted,

W. J. PATTERSON,

Director.