

INTERSTATE COMMERCE COMMISSION  
WASHINGTON

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REPORT NO. 3521  
UNION PACIFIC RAILROAD COMPANY  
IN RE ACCIDENT  
NEAR APEX, MONT., ON  
APRIL 7, 1953

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SUMMARY

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Date: April 7, 1953  
Railroad: Union Pacific  
Location: Apex, Mont.  
Kind of accident: Derailment  
Train involved: Passenger  
Train number: 29  
Engine number: 3801  
Consist: 8 cars  
Estimated speed: Undetermined  
Operation: Timetable and train orders  
Track: Single; 9° curve; 1.70 percent descending grade westward  
Weather: Snowing  
Time: 6:30 a. m.  
Casualties: 2 killed; 14 injured  
Cause: Excessive speed on curve

INTERSTATE COMMERCE COMMISSION

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REPORT NO. 3521

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION REPORTS  
UNDER THE ACCIDENT REPORTS ACT OF MAY 6, 1910.

UNION PACIFIC RAILROAD COMPANY

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July 9, 1953

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Accident near Apex, Mont., on April 7, 1953, caused by  
excessive speed on a curve.

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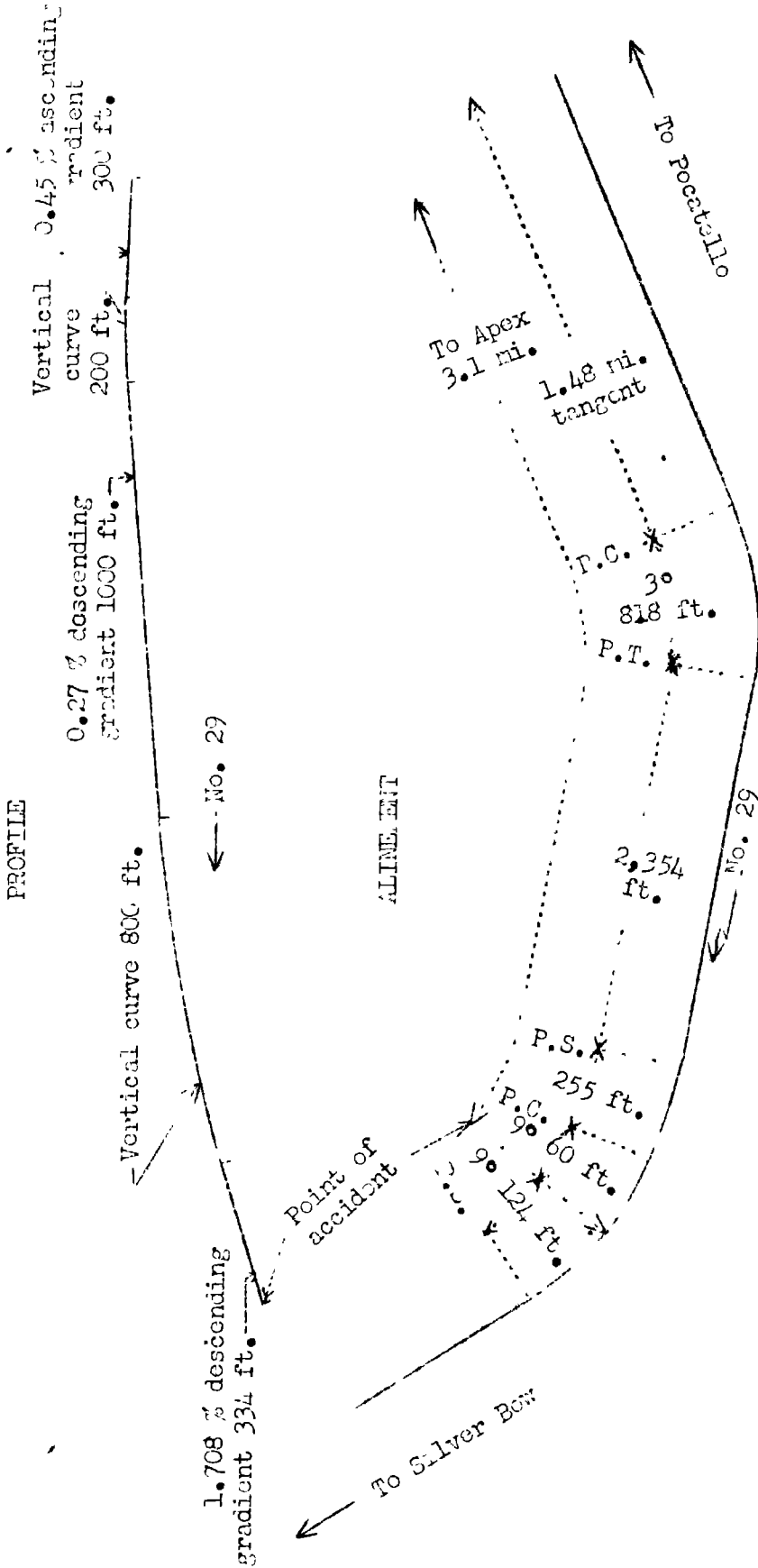
REPORT OF THE COMMISSION<sup>1</sup>

PATTERSON, Commissioner:

On April 7, 1953, there was a derailment of a passenger train on the Union Pacific Railroad near Apex, Mont., which resulted in the death of two train-service employees, and the injury of four passengers, two Pullman Company employees, two Railway Express Agency employees, four dining-car employees, one chair-car attendant, and one train-service employee.

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<sup>1</sup>  
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.



○	Pocatello, Ida.	194.1 mi.
○	Dillon, Mont.	12.3 mi.
○	Apex	3.1 mi.
X	( Point of accident )	46.6 mi.
○	Silver Bow, Mont.	

Report No. 3521  
 Union Pacific Railroad  
 Apex, Mont.  
 April 7, 1953

Location of Accident and Method of Operation

This accident occurred on that part of the Idaho Division extending between Pocatello, Idaho, and Silver Bow, Mont., 256.1 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. There is no block system in use. The accident occurred on the main track at a point 209.5 miles west of Pocatello and 3.1 miles west of Apex, Mont. From the east there are, in succession, a tangent 1.48 miles in length, a 3° curve to the right 818 feet, a tangent 2,354 feet, a spiral 255 feet, and a 9° curve to the right 60 feet to the point of accident and 124 feet westward. From the east there are, in succession, a 0.45-percent ascending grade 300 feet, a vertical curve 200 feet, a 0.27-percent descending grade 1,000 feet, a vertical curve 800 feet, and a 1.708-percent descending grade 334 feet to the point of accident. At the point of accident the track is laid on a fill approximately 2 feet in height. A short distance west of the point of accident the fill is approximately 5 feet in height.

On the curve on which the accident occurred the track structure consists of 90-pound rails, 39 feet in length, laid new in 1940 on an average of 22 treated fir ties to the rail length. It is fully tieplated with heavy duty canted tieplates and is provided with 4-hole continuous joint bars, an average of 12 rail anchors and 8 rail braces per rail, and 6 gage rods per panel. Each rail is single-spiked on the outside and double-spiked on the inside. The track was raised 6 inches on new crushed rock ballast in September, 1952. The specified superelevation on the curve on which the accident occurred is 4-1/2 inches.

A reduce-speed sign bearing the numerals "50-40", a sign bearing the numerals "30-20", and a sign bearing the numerals "35-25" are located, respectively, 5,214 feet, 1,854 feet, and 869 feet east of the point of accident. These signs are 3 feet in height and 11-3/4 inches in width. They are mounted on posts and are approximately 9 feet above the level of the tops of the rails and 11 feet 6 inches north of the center-line of the track. The numerals are in black on a reflectorized yellow background.

Timetable special instructions read in part as follows:

10 (R). Operating Rule 10 (H) is changed to read:

"Reduce Speed sign showing by figures the maximum speed permitted, placed on engineer's side of track, indicates that the track 2500 feet distant is in condition for a speed of not more than indicated by the sign. Example: 60-40-25 will indicate maximum speed of 60 MPH for streamline trains, 40 MPH for DE-Psgr. and Psgr. trains, 25 MPH for freight trains.

Resume Speed sign placed on engineer's side of track, indicates that the Reduce Speed location has been passed.

The entire train must pass over the designated location at the specified speed.

Such speed restrictions will also be shown in timetable or superintendent's bulletin."

The maximum authorized speeds for passenger trains as specified in the timetable are 60 miles per hour on tangent track, 50 miles per hour on the 3° curve east of the point of accident, and 30 miles per hour on the curve on which the accident occurred.

#### Description of Accident

No. 29, a west-bound first-class passenger train, consisted of engine 3801, two baggage cars, one baggage-mail car, two coaches, one dining-car, and two sleeping cars, in the order named. The seventh car was of lightweight steel construction, and the other cars were of conventional all-steel construction. This train departed from Dillon, 15.4 miles east of the point of accident and the last open office, at 8:02 a. m., 39 minutes late, and while moving at an undetermined rate of speed the engine and tender, the first five cars, and the front truck of the sixth car were derailed at a point 3.1 miles west of Apex.

The engine and tender remained coupled. They stopped on their left sides, with the front of the engine 260 feet west of the point of accident and 44 feet south of the track and the rear of the tender 110 feet south of the track. The first car turned end for end and stopped on its left side with its top against the running gear of the engine. The

second car stopped on its left side. The front end was on the edge of the track structure approximately 290 feet west of the point of accident, and the rear end was against the rear end of the first car. The third car stopped against the bottom of the first car and parallel to it. It leaned to the south at an angle of about 40 degrees. The fourth, fifth, and sixth cars remained upright. The fourth car stopped with the front end against the rear end of the third car and the rear end 15 feet south of the track. The fifth and sixth cars stopped approximately in line, with the front end of the fifth car against the rear end of the fourth car, and the rear end of the sixth car on the track. The engine and tender were considerably damaged. The first four cars were badly damaged, and the fifth and sixth cars were considerably damaged.

The engineer and the fireman were killed. The train baggageman was injured.

Snow was falling at the time of the accident, which occurred at 6:30 a. m.

Engine 3801 is of the 4-6-6-4 single-expansion articulated type. The total weight in working order is 594,610 pounds, distributed as follows: engine truck, 90,950 pounds; driving wheels, 405,660 pounds; and trailing truck, 98,000 pounds. The specified diameters of the engine-truck wheels, the driving wheels, and the front and back trailing-truck wheels are, respectively, 33 inches, 69 inches, 36 inches, and 48 inches. The driving wheelbase of each engine is 12 feet 2 inches long, the total driving wheelbase is 35 feet 1 inch long, and the total wheelbase is 59 feet 11 inches long. The total length of the engine and tender, coupled, is 111 feet 6-7/8 inches. The tender is of the Vanderbilt type and is equipped with two 6-wheel trucks. Its capacity is 6,000 gallons of oil and 18,106 gallons of water. Its weight when fully loaded is 522,600 pounds. The accumulated mileage of the engine since class repairs was 16,353. The last trip inspection and repairs were completed at Pocatello on April 6, 1953. The theoretical overturning speed of this engine moving on a 9° curve having a superelevation of 4-1/2 inches is 58 miles per hour.

### Discussion

As No. 29 was approaching the point where the accident occurred the enginemen were on the engine, the front brakeman was in the fourth car, and the conductor was in the rear car. The flagman had unintentionally been left at Armstead, 36.4 miles east of the point of accident. The brakes of the train had been tested at Lima, 60.4 miles east of Apex, and apparently had functioned properly when used in making several station stops and in controlling the speed of the train at various points en route. The conductor and the brakeman said that the brakes were applied as the train approached a 3-degree curve 2.3 miles east of the point of accident, and then were released. They said the brakes were again applied as the train approached the 3-degree curve 3,427 feet east of the point of accident. The conductor said the brakes were then released, but the brakeman thought they were only partially released. However, both said that there was no application made immediately before or after the train entered the 9-degree curve on which the accident occurred. They stated that the speed of the train was about 30 miles per hour when the derailment occurred.

Examination of the track structure throughout a considerable distance immediately east of the point of accident disclosed no indication of dragging equipment nor of an obstruction having been on the track. Throughout a distance of 68 feet 6 inches immediately east of the point of accident the track was shifted outward on the 9-degree curve. The maximum displacement from normal alignment was 1 inch at the point of accident. In the immediate vicinity of the point of accident a section of rail measuring  $17\frac{1}{2}$  inches along the head and  $21\frac{1}{2}$  inches along the base was broken from the outside rail. The east end of this section was 13 feet 2 inches from the receiving end of the rail. A piece of the head  $3\frac{1}{2}$  inches long at the west end of the broken section was not recovered. The remainder of the head was found inside the curve, opposite the point of accident and 10 feet from the center-line of the track. The head of the rail immediately west of the west end of the broken section was bent outward  $1\text{-}\frac{3}{4}$  inches over a distance of about 12 inches. The fractures in this rail were new and apparently caused by lateral stresses directed toward the gage side. There was a batter mark on the web and on the head of the rail at the most westerly break. Laboratory analysis of the rail disclosed no structural defects. The first mark of derailment appeared on the inside angle bar of the joint in the low rail about 29 feet east of the broken rail, and the next joint westward on the low rail bore marks indicating that it had been struck by some object inside the low rail.



Examination of the engine after the accident occurred disclosed no condition which could have caused or contributed to the cause of the derailment or which could have caused the engine to exert unusual stresses on the track structure. There were no marks or debris on the wheels of the engine. The engine slid on its left side in practically a tangential direction from a point a few feet west of the broken rail a distance of 260 feet westward, and the front of the engine stopped 44 feet and the rear of the tender 110 feet south of the track.

Although the conductor and the brakeman estimated the speed of the train at the time of the accident at about 30 miles per hour, the maximum authorized speed at the point involved, other evidence indicates that the speed was considerably greater. The engine turned over to the outside of the curve. The shifting of the track outward on the curve and the manner in which the rail was broken and bent indicate that excessive pressure was exerted against the high rail. The outside rail was broken and one or more wheels battered the east end of the west portion of the rail. The conductor said the brakes were released on the 3-degree curve immediately east of the 9-degree curve and the brakeman thought they were partially released, and both said they were not reapplied before entering the 9-degree curve on the 1.7 percent descending grade. The traveling engineer said that, "if an engineer releases his brakes after slowing down for the 3-degree curve immediately before reaching the 9-degree curve, he is in trouble right now." The speed limit on the 3-degree curve was 50 miles per hour and on the 9-degree curve it was 30 miles per hour. The train moved down a descending grade, the gradient increasing from 0.27 to 1.7 percent, a distance of at least 3,000 feet after the brakes were released or partially released. Under these conditions the speed would be considerably increased. The shifting of the track toward the outside of the curve, the fact that the first car turned end for end and stopped alongside the engine, and that the third car stopped alongside the first car are further indications that the speed was considerably higher than the maximum authorized speed of 30 miles per hour.

On the day of the accident the engineer who was regularly assigned to No. 29 between Lima and Silver Bow was unable to report for duty, and the engineer who operated the engine from Pocatello to Lima was instructed to continue through to Silver Bow. This engineer was regularly assigned in passenger service between Pocatello and Lima. He had previously worked on the district between Lima and Silver Bow, but since 1931

he had not made a trip over this district as an engineer. During this time he had ridden over the district as a passenger occasionally, and before leaving Lima he said he was confident that he was familiar with the territory. The fireman had made six west-bound trips between Lima and Silver Bow during the 6 months preceding the day of the accident, but only one of these trips had been in passenger service. The members of the train crew said they noticed nothing unusual in the handling of the train before the derailment occurred and they thought that all speed restrictions had been observed. However, considering the length of time since the engineer had operated an engine west of Lima, it appears probable that he may have misjudged the distance between the curve immediately east of the point of accident and the curve on which the accident occurred.

Cause

It is found that this accident was caused by excessive speed on a curve.

Dated at Washington, D. C., this ninth day of July, 1953.

By the Commission, Commissioner Patterson.

(SEAL)

GEORGE W. LAIRD,  
Acting Secretary.