INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN ACCIDENT ON THE CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD NEAR GUTTENBERG, IOWA, ON OCTOBER 11, 1934.

November 24, 1934.

To the Commission:

On October 11, 1934, there was a derailment of a passenger train on the Chicago, Milwaukee, St. Paul & Pacific Railroad near Guttenberg, Iowa, which resulted in the death of 1 passenger and 3 employees, 1 of whom was off duty, and the injury of 13 passengers, 2 mail clerks, 1 trespasser and 7 employees, 4 of whom were off duty.

Location and method of operation

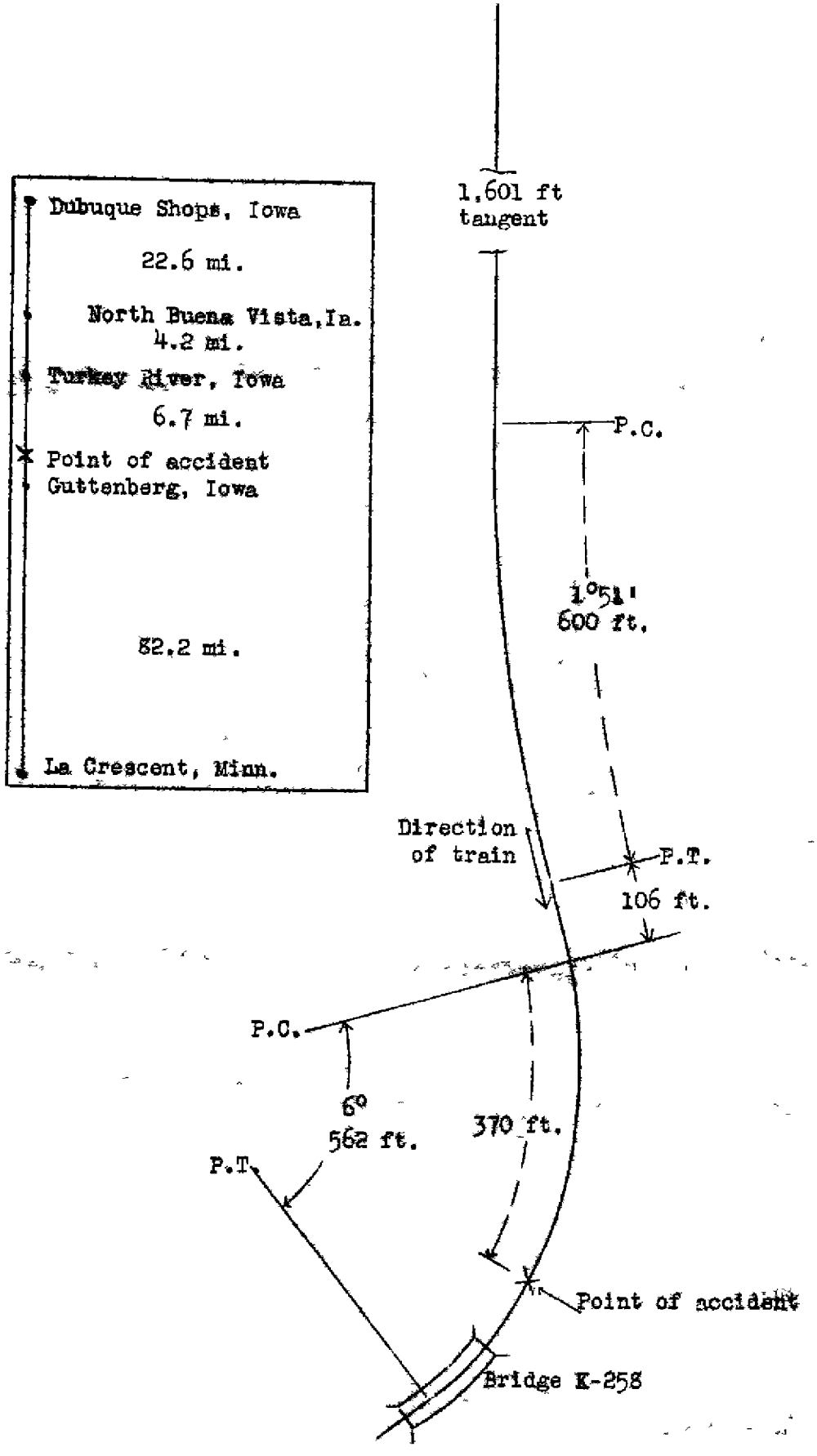
This accident occurred on that part of the Dubuque & Illinois Division, Second District, extending between Dubuque Shops, Iowa, and La Crescent, Minn., a distance of 115.7 miles; in the vicinity of the point of accident this is a single-track line over which trains are operated by time table, train orders, and a manual block-signal system. The accident occurred 1.84 miles east of the depot at Guttenberg or approximately 102 feet east of bridge K-258; approaching this point from the east, the track is tangent for a distance of 1,601 feet and then there is a $1^{\circ}51'$ curve to the left 600 feet in length, followed by 106 feet of tangent and a 6° curve to the right 562 feet in length, the first mark of derailment appearing in the ballast on the outside of this latter curve at a point 370 feet from its eastern end. The grade is practically level.

The track is laid with 100-pound saved rails 31 feet in length, with 19 hardwood ties to the rail length, fully tie-plated and single-spiked on the outside and double-spiked on the inside of the curve involved, ballasted with cinders to a depth of about 12 inches; 6 anti-creepers per rail also are used. The track is well maintained.

Bridge K-258 is a pile trestle 138 feet in length, with a ballast-covered deck, it has a maximum height of 14.9 feet over the small creek which it spans. The eastern approach to the bridge is composed of an earth and rock fill about 400 feet in length and 8 feet in height. Passenger trains are limited to a speed of 45 miles per hour.

The weather was clear at the time of the accident, which occurred about 7:28 a.m.

Inv. No. 1936
Chicago, Milwaukee, St.Paul & Pacific R.R.,
Guttenberg, Iowa
October 11, 1934



Description

West-bound passenger train no. 35 consisted of 1 mail and express car and 1 coach, in the order named, both of all-steel construction, hauled by engine 6100, of the 4-6-2 type, and was in charge of Conductor Merwin and Engineman Strazinsky. This train left Dubuque Shops at 6:30 a.m., according to the train sheet, 12 minutes late, left North Buena Vista, 10.9 miles east of Guttenberg and the last open office, at 7:10 a.m., according to the train sheet, 18 minutes late, made a station stop at Turkey River, 4.2 miles west of North Buena Vista, and was nearing Guttenberg when it was derailed while traveling at a speed estimated to have been about 45 miles per hour.

The entire train was derailed to the left and stopped down the embankment and parallel with the track. The engine was on its left side with its front end 65 feet west of the west end of bridge K-258 or 305 feet west of the first mark of derailment, while the two cars were in line with the engine and behind it; the first car was upright but off its trucks, with its head end against the back end of the engine, and the second car was leaning to the left at an angle of about 60 degrees and against the tender, opposite the trestle. The front end of the tender was about 85 feet to the rear of the engine, and the cab of the engine was found bottom up against the front end of the tender. The employees on duty who were killed were the engineman and fireman, while the employees on duty who were injured were the conductor, baggageman and brakeman.

Summary of evidence

Conductor Merwin and Brakeman Mehsling were in the coach, while Baggageman Hess was in the mail and express car; none of them was aware of anything wrong until the accident occurred, at which time the conductor estimated the speed to have been 44 or 45 miles per hour. They did not notice anything wrong with track conditions or the way the train was handled en route, nor did they notice any indication of excessive speed. Before departing from Dubuque Shops the conductor talked with Engineman Strazinsky and the engineman appeared normal in every respect. The conductor and brakeman said that the coach rode smoothly but the brakeman said the baggage car rode so roughly that he was afraid to go into it; however, Baggageman Hess said that there was nothing about the riding qualities of the baggage car to alarm him. The air brakes had been tested, but none of these employees knew whether the brakes were applied just prior to the accident. The statements of several employees who were deadheading on the train added nothing to those of the conductor,

brakeman and baggageman except that one of them thought the speed was a little high when east of Specht's Ferry, 22.4 miles east of Guttenberg.

There was some question as to whether Train No. 35 left North Buena Vista at 7:10 a.m., as shown by the train sheet, or at 7:13 a.m., as shown by the block sheet. It is not believed that this had any important bearing on the cause of the accident, however, for even if the block sheet was correct the average speed of the train to the point of derailment, allowing for 3 minutes consumed in stopping at Turkey River, was only 45 miles per hour; if the train departed at 7:10 a.m., then the average speed was only 36 miles per hour.

According to the statements of Division Engineer Johnson, the first mark of derailment was in the ballast on the outside of the curve at a point 102 feet east of the bridge and 5.6 feet from the center of the track; this mark continued for a distance of 27.3 feet and then turned back toward the south rail, the first tie to be marked being about 65 feet from the bridge. The south ends of the ties then were badly damaged to the bridge and also for a distance of 72 feet on the bridge, several of them being broken under the south rail. The track was out of line toward the outside of the curve, beginning opposite the first mark in the ballast and extending upon the bridge for a distance of 96 feet; about 50 feet from the bridge it was 8 inches out of line and the maximum variation was 10 inches, at a point on the bridge near its eastern end. In addition, the first rail east of the bridge on the south side of the track had been broken, apparently by force applied from the gauge side and it also had been bent downward. The initial mark in the ballast was a few feet from the leaving end of the fourth rail east of the bridge; there were no marks on this rail but the third rail from the bridge apparently had been subjected to a heavy blow on the ball of the rail, grease and rust having been disturbed from the web and also a portion of the head; the second rail had similar indications at two points which were about 16 feet apart and it also was twisted slightly, raising the inside spikes for a distance of 8 feet at its leaving end; on the ball of the broken rail there were marks which indicated where wheels might have passed over it at its receiving end, although these marks were more in the nature of abrasions than flange marks; the division engineer thought that if made by flanges the trucks must have been slewed to one side in order to produce the abrasions. All of these marks terminated 5 feet from the receiving end of this rail, but beginning about 6½ feet from the receiving end there was a shear mark starting at the gauge side and crossing diagonally toward the outside, this mark being about 5 feet in length and from 3/4 of an inch to 1 inch in width. Close to

the leaving end there was another shear mark on the outside of the ball of the rail, beginning east of the point where the rail had been broken and continuing westward to the end of the rail and for a distance of about 5 feet upon the first rail on the bridge, this latter mark being 11/32 inch deep and 9/16 inch wide, and he did not think the rail could have been broken before this mark was made. Division Engineer Johnson checked the gauge, alinement and elevation on the undisturbed portion of the track and found them to be maintained in good condition; the elevation was 3 inches except for a distance of 1½ rail lengths where it measured 2-5/8 inches. The rails were curve-worn but not to any great extent, and it was his opinion that such damage as the bridge itself sustained was a result of the accident. He did not think that excessive speed or track conditions could have caused the accident, but expressed the theory that the tender could have been the first part of the train to be derailed and then have pulled the engine off the track.

Division Superintendent Donald was unable to arrive at any conclusion as to what caused the accident; he did not think it was due to excessive speed, basing this opinion on the condition of the wreckage and also the alinement of the equipment parallel to the track, whereas he thought that speed would have resulted in the equipment leaving the track more nearly at a tangent; furthermore, in the event speed had been the cause the front end of the engine would have been derailed first, whereas he thought it was clear that such was not the case. He also said the distance the train ran on the curve prior to derailment was an indication that the accident was not due to speed, and in his opinion no specific marks on the track structure, nor any specific damage to the engine, tender or cars, could be identified with any degree of certainty as indicating the cause of the accident.

Roadmaster Kemp thought the marks in the ballast on the outside of the south rail were made by something dragging. About 25 feet east of the bridge there was a mark on a rail anchor on the north rail, followed by wheel marks on the ties extending diagonally toward the left for a distance of 60 feet, directly in line with the point where the rear truck of the coach stopped, he did not find any marks between the rails east of the rail anchor and did not come to any conclusion as to the cause of the accident, but thought the broken rail resulted from pressure applied from the outside, which opinion also was expressed by Roadmaster Kelsey. Roadmaster Kemp examined the track for some distance east of the point of accident and found where blows, apparently from a wheel, had resulted in breaking the rust on the outside edge of the south rail at intervals of 8 feet 6 inches, some of these indications being found as far back as the second curve east of the derailment.

Section Foreman Hook stated that in his opinion there was nothing about the track that caused the accident, nor did he think that the broken rail had anything to do with it; but rather that dragging equipment probably was a factor. He last performed work on the curve in question on October 1, picking up joints and smoothing out low spots, and he said that on that same day the track-lining gang went over the track ahead of his force. He last patrolled the track during the morning of the day prior to the accident, but found nothing wrong.

Assistant Superintendent of Motive Power Bjorkholm and Division Master Mechanic Mullen inspected engine 6100 both before and after it was rerailed. The former stated that after the engine left the track it apparently landed on the ground upside down, somewhat to the left of the top center line of the boiler, tearing off the smoke stack, bell and bell stand, sand box, and various other appurtenances; little damage was sustained by the front end of the engine. The engine truck and engine-truck wheels were lying on the ground opposite the cylinders; the engine truck was practically demolished; however, the wheel flanges were in good condition and there was nothing wrong with the castings. The running gear of the engine was in good condition and intact, with the exception of the trailer, and the driving gear also was intact, with rods and valve motion members in good condition and properly connected. All driving-wheel tire flanges were of good contour; the lateral of the front wheels was 3/16 inch, while the main and back wheels had a lateral of 1/4 inch. The spring rigging was intact and in good condition, with the exception of the left trailer equalizer, which had broken through the center-pin hole, apparently a result of the accident. The brake rigging was intact except for a fresh break in the left back driver brake hanger. On the following day after the engine was rerailed further inspection was made, at which time it was noted that all wedges were free and well lubricated. The right trailer frame was bulged outward about 8 inches, the left trailer frame was broken, and the back end of the tail piece shifted 4 inches to the right. The right trailer wheel was sprung approximately 2½ inches and the right trailer tire had been forced outward approximately 1 inch at one point and directly opposite this point it had been moved about 1/8 or 3/16 inch; the indications were that the tire had not been loose on the wheel, but that it had been forced outward by coming in contact with some object during the course of derailment; the shifted tire had not revolved on the rails. There were pronounced rubbing marks on the bolts attaching the right trailer jaws to the trailer frame, evidently caused by the right trailer wheel, and a pronounced mark on the lower outside edge of the right trailer frame 17½ inches back of the center of the trailer box; there were nine pronounced marks on the right trailer flange, origin

undetermined, and the inside of that tire showed a pronounced rubbing mark for half its circumference, on that portion which had shifted the greatest distance, and also on the wheel center. On the left side there was a rubbing mark on the lower edge of the trailer frame 28 inches ahead of the center of the box, slight rubbing marks on the inside of the tire, and a light mark on the tire. The drawbar between the engine and tender was broken and that part attached to the engine was bent downward 2 inches; the drawbar was twisted at the point of breakage. That portion of the drawbar attached to the tender was bent downward 13 inches, with a crack in the bar 10 inches from the drawbar pin hole and the left top edge of this piece showing a pronounced rubbing mark 5½ inches long. The tender trucks were intact, although some members were badly bent and twisted. Mr. Bjorkholm said that the almost total absence of marks on the track where the derailment occurred made it very difficult to form any definite opinion as to just how the engine left the rails, or whether the engine or the tender was the first to be derailed; he believed, however, that the damage to trailer truck and all other damage to the engine and tender occurred as a result of the derailment, and did not think that high speed or the surging of water in the tank, which was about half full, had anything to do with it, neither could he say whether the broken rail was the cause or a result of the accident. It was his opinion, however, that the marks on the ties east of the broken rail were made by the rear car after the head end of the train had been derailed.

Superintendent of Motive Power Anderson and Mechanical Engineer Bilty stated that after considering every phase of the derailment they had decided that the broken rail was responsible, and that the damage to the equipment happened after the accident, there being no evidence that any part of the equipment was responsible due to the fact that no parts of the engine equipment were found where the engine was derailed or back of it.

Examination of the engine by the Commission's inspectors disclosed conditions substantially as described by the assistant superintendent of motive power. The tender trucks could not be identified, but the box bolts on what might have been the left front corner of the front truck were broken and the tie strap bent downward. It also was noted that there were two marks on the under side of the pilot about 3 feet to the left of the center of the pilot, one 3/8 and the other 3/4 inch deep.

Conclusions

The cause of this accident was not definitely determined.

The first evidence of anything wrong consisted of the indications referred to by the roadmaster of something having struck heavy blows on the ball of the south rail, these blows having been sufficient to break the rust on the outside edge of the rail at intervals of 8 feet 6 inches and being found as far back as the second curve east of the derailment. The next marks were found in the ballast on the outside of the south rail 102 feet from the bridge, the object making this mark apparently traveling parallel to the rail for a short distance and then swinging back toward the rail, finally beginning to mark ties at a point about 37 feet from where the ballast was first disturbed. West of this point the south ends of the ties were badly damaged but there were no marks on the ties between the rails until a point was reached nearly 75 feet beyond the first marks in the ballast. It further appeared that the engine turned in the air after leaving the rails and landed at the bottom of the fill nearly bottom up, but without sufficient centrifugal force to cause it to roll over on its right side, the engine instead settling back and stopping on its left side. The opinion was expressed by some witnesses that the accident was caused by a broken rail; however the weight of evidence indicated that the broken rail found after the accident was a result and not the cause of the accident. The nature of the damage sustained by the engine raised a question as to whether there might have been a failure of some part of the trailer assembly, while the theory also was advanced that the tender, which stopped about 85 feet to the rear of the engine, might have been first to be derailed. It can not be definitely stated, however, that the accident was due to an equipment failure, or that the tender became derailed as a result of the surging of water in the cistern, neither can it be stated that the speed was in excess of the maximum permissible speed of 45 miles per hour. In this connection, however, the fact is noted that an elevation of only 3 inches was provided on this 6° curve whereas the maximum speed authorized is 45 miles per hour; in the 1929 proceedings of the American Railway Engineering Association it appears to be a system practice of this railroad to keep down the elevation to 3 inches wherever practicable; however, the formula used by this railroad in determining elevation would have called for an elevation of $6\frac{3}{4}$ inches, whereas the practice of many railroads is to provide an elevation of 6 inches for a speed of 45 miles per hour on a 6° curve, and the recommended practice of the American Railway Engineering Association provides for an elevation of slightly

more than 8 inches under these circumstances. It is, to say the least, questionable whether an elevation of only 3 inches on this curve was adequate for the maximum speed authorized.

Respectfully submitted,

W. J. PATTERSON,

Director.

BUREAU OF SAFETY

REPORT NO. 1937

Railroad:	Chicago, Rock Island & Pacific
Date:	October 12, 1934.
Location:	Downey, Iowa.
Kind of accident:	Derailment and collision
Trains involved:	Passenger and passenger
Casualties:	2 killed; 8 injured
Summary of facts:	First train derailed account broken rail; other train was too close to be stopped and collided with wreckage.
Cause of accident.	Broken rail