Inv-2133

INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE

INTERNATIONAL-GREAT NORTHERN RAILROAD

COLORADO BRIDGE, (AUSTIN) TEXAS

JANUARY 5, 1937

INVESTIGATION NO. 2133

SUMMARY

Inv-2133

Railroad:	International-Great Northern
Date:	January 5, 1937
Location:	Colorado Bridge, (Austin) Texas.
Kind of accident:	Derailment
Train involved:	Passenger
Train number:	No. 6
Engine number:	No. 6425
Consist:	9 cars
Speed:	10-35 m.p.h.
Track:	12° 30' curve; grade slightly descending northward.
Weather:	Cloudy
Casualties:	1 killed; 4 injured
Cause:	Excessive speed on sharp curve.

Inv-2133

February 27, 1937.

To the Commission:

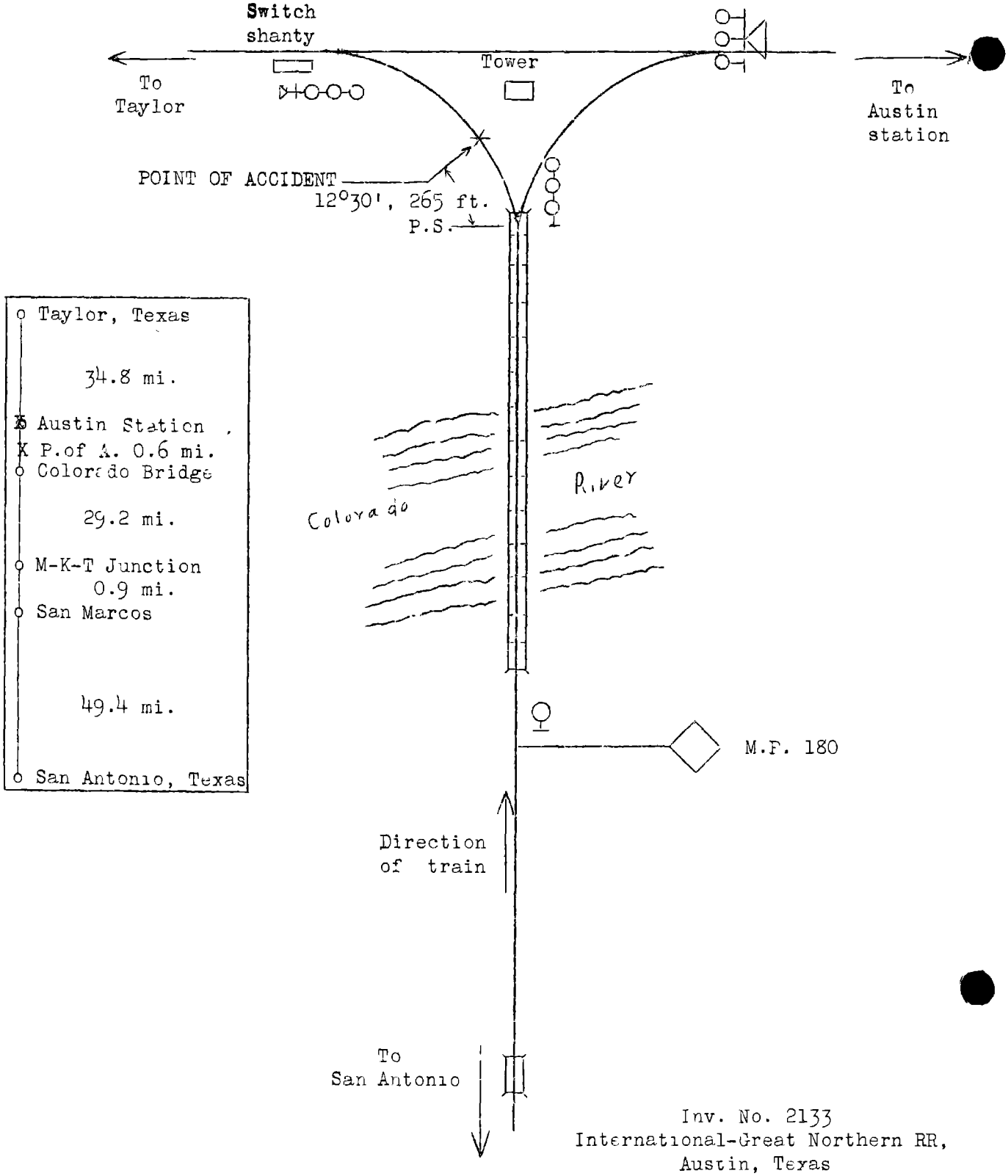
On January 5, 1937, there was a derailment of a passenger train on the International-Great Northern Railroad near Colorado Bridge, (Austin) Texas, which resulted in the death of 1 employee and injury to 2 passengers, 2 persons carried under contract and 1 trespasser.

Location and method of operation

This accident occurred on the Austin District of the San Antonio Division, extending between San Antonio and Taylor, Texas, a distance of 114.3 miles; between San Marcos and Colorado Bridge, a distance of 30.1 miles, within which territory the accident occurred, this is a single track line over which trains are operated by time table, train orders and an automatic block-signal system.

Time table directions are used throughout this report. Approaching the point of accident from the south, the track is tangent for more than a mile, extending to the north end of Colorado River bridge; there is then a 12° 30' curve to the left, 794 feet in length. At the south end of this curve a track leading to Austin passenger station diverges to the right on a similar curve; the normal position of the switch at this point is for a main track movement. These two curves form the west and east legs, respectively, of a wye and a track connecting the north ends of the curves forms the north leg of the wye. The wye switches are operated from an interlocking tower located approximately in the center of the wye; wayside signals indicate the position of the wye switches. Passenger trains entering Austin from the south, proceed over the west leg of the wye and back through the north leg to the station. The accident occurred on the curve forming the west leg of the wye, 265 feet from the receiving or south end. The grade is 1.25 per cent descending northward for approximately 3½ miles, to a point 3,150 feet south of the point of accident, followed by 755 feet of level track, 610 feet of 0.83 per cent ascending grade, 1,520 feet of level track across the bridge, and then 794 feet of 0.94 per cent descending grade to the end of the curve.

The track is laid with 90-pound rail, 39 feet in length, with 24 treated and gumwood ties to the panel; it is fully tie plated and double spiked on the outside of the



Inv. No. 2133
International-Great Northern RR,
Austin, Texas
Jan. 5, 1937

rails, and is ballasted with crushed rock to a depth of 10 or 12 inches below the ties. The elevation on the curve where the derailment occurred is 2½ inches, and the gauge is 4 feet 9 inches; 5 gauge rods are used per panel. The track is well maintained and at the point of derailment is on a 25 foot fill which tapers to a depth of about 5 feet at the west switch of the wye, 529 feet distant. Trains are required to run at restricted speed between Austin and wye switches at Colorado River Bridge.

The weather was cloudy at the time of the accident which occurred about 12:43 a.m.

Description

Train No. 6, a northbound passenger train, consisted of 3 baggage cars, 1 chair car, 1 Pullman sleeping car, 1 coach, 2 Pullman sleeping cars and 1 chair car, in the order named, hauled by engine 6425, and was in charge of Conductor Chatham and Engineman Rothman. All of the cars in the train were of all-steel construction except the third car, which had a steel underframe. This train departed from San Antonio at 11:00 p.m., January 4, on time, passed M-K-T Junction, the last open office, at 12:10 a.m., January 5, according to train sheet, 3 minutes late, and was derailed on the west leg of the wye at Colorado Bridge, Austin, while traveling at a speed variously estimated to have been between 10 and 35 miles per hour.

The locomotive turned over to the right and stopped practically bottom side up with its head end 17 feet from the track, and 445 feet beyond the south wye-switch; the tender, also upside down but still coupled to the locomotive, lay with its head and rear ends 37 and 60 feet, respectively, from the center of the track; the head baggage car, I-GN 200, became uncoupled at both ends but remained on its trucks, and stopped with its head end 77 feet, and the rear end 26 feet from the center of the track, and 356 feet north of the south wye-switch, tilted to the right at an angle of about 45 degrees; the remaining 8 cars in the train remained coupled and continued northward around the curve coming to a stop with the front truck of the second baggage car, MP 4248, derailed at a point 642 feet beyond the south wye-switch. None of the other cars in the train was derailed.

The employee killed was the engineman.

Summary of evidence

Fireman Hood stated that prior to leaving San Antonio the air brakes were tested and that brake operation was satisfactory when making stops prior to the derailment. As the train approached Colorado Bridge at a speed of about 40 or 45 miles per hour, the signal at the south end of the wye was in proceed position, and while on the bridge Engineman Rothman made a service application of the train brakes which reduced the speed to about 20 or 25 miles per hour as the train entered the west leg of the wye, and this application was still effective when the derailment occurred. Shortly after entering the wye, the engine swerved and left the rails and seemed to be turning over. He called a warning to Engineman Rothman who then made an emergency application of the brakes. Fireman Hood was unable to state which part of the engine left the rails first, and had formed no opinion concerning the cause of the derailment. He has been on this run with Engineman Rothman since about October 1st and thought that on the night of the accident the handling of the brakes and the speed of the train, in the vicinity of the bridge and the point of derailment, were as usual. It was his first trip on engine 6425, but he had found it to be a good riding engine, taking all curves well and having no indication of stuck wedges; there had been no rocking of the tender even while running at high speed. The tender was filled with oil at San Antonio, and a full tank of water was taken at San Marcos. Engineman Rothman seemed to be in normal condition during the trip and responded to the calling of signals en route.

Conductor Chatham stated that before leaving San Antonio he had talked with Engineman Rothman and he appeared to be in normal condition at that time. While approaching Austin at a speed of about 15 miles per hour he was in the last car of his train and felt the emergency application of the brake made at the time of the derailment. He later made an inspection of the derailed train but could form no opinion as to the cause of the derailment. He knew that trains are required to run at restricted speed between Austin and the wye switches at Colorado Bridge, but thought that the only speed restriction applicable to movements around the wye would be a turnout restriction, if any. Just prior to the emergency application, while the train was on the bridge, he heard a release of the train brakes. At the time of the accident the weather was damp but it was not raining.

Brakeman Coleman stated that as his train was approaching Colorado Bridge at a speed of about 50 miles per hour he felt a service application of the brake which

was not released up to the time the emergency application was made when the derailment occurred. Brakeman Coleman, Train Porter Maney and Express Messenger Moore estimated the speed of the train at the time of derailment as being from 20 to 25 miles per hour, which they said was about the usual speed at this point.

Flagman Honeyman of train No. 98, which arrived at Austin at 12:20 a.m. January 5, and was the last preceding train to pass over this curve, was an eye witness of the derailment; he estimated the speed of train No. 6 at the time of accident as being between 30 and 35 miles per hour, which was faster than usual. He thought that the front truck of the first baggage car was the first to become derailed, and based his opinion on the fact that he had seen white sparks flying from that truck. Four other members of the crew of train No. 98 stated that there was no indication of anything wrong with the track when their train moved over it.

Master Mechanic Stark stated that he made a thorough examination of the derailed equipment and found nothing that might have caused the accident. Engine 6425 had made about 1,000 miles since the driver and the engine-truck tires were turned to proper contour. Measurements showed 3/8 inch lateral motion on the engine truck and trailer truck, 1/8 inch on the front and rear drivers and 3/16 inch on the main drivers.

General Car Foreman Bell stated that after baggage car 200 was moved to San Antonio, and before repairs were made, he gauged the north end coupler and found it to be 31½ inches high; after repairs had been made to the body spring and the spring plank casting, the coupler was gauged and found to be 32 3/8 inches high; later a new coupler was installed which had a height of 33 7/8 inches.

Division Engineer Cook stated that an elevation of 2½ inches, and a gauge of 4 feet 9 inches are maintained on the curve involved and that after the accident he gauged and checked the level of the track between the south wye-switch and the first mark of derailment and found no variation of elevation in excess of 3/16 inch; the gauge varied from 4 feet 9 inches to 4 feet 9¼ inches. Under Engineering Department instructions, the maximum speed permissible on a 12° 30' curve having a 2½ inch elevation is 30 miles per hour. During his examination of the track he found one rail on the outside of the curve kinked downward and inward near

each end. The distance between the kinks was the distance between the engine-truck wheels and the trailer wheels of engine 6425, and it was his theory that the kinks in the rail occurred when the weight of the engine was all transferred to one side at the time the engine turned over. He thought that the operation of the train around the curve at too great a speed might have caused the derailment. He further stated that on numerous occasions he had ridden around this curve on passenger trains, and he estimated the usual speed of northward trains at this point to be from 15 to 20 miles per hour.

Trainmaster Holzman stated that he knew of no speed restriction governing the movement of trains around the west leg of the wye, other than the time table instruction restricting speed between Austin and wye switches at Colorado River Bridge. He has ridden a number of north bound passenger trains around the wye and the usual speed is about 15 miles per hour.

Inspection of the track by the Commission's inspectors showed that the first indication of derailment was a flange mark on a tie, 265 feet north of the south wye-switch and 17 inches outside the gauge of the high rail. Flange marks continued on the ends of the ties, parallel to the outside rail, for a distance of approximately 100 feet from that point, and then apparently the wheels left the ties. The first wheel mark inside the low rail appeared on a spike head 320 feet north of the south switch, and these marks continued to the point where the opposite flange mark disappeared. Continuing for a distance of 280 feet from this point there were a number of flange marks which appeared to have been made by the front truck of the second baggage car, MP 4248. At no place was there any indication of dragging equipment or of a wheel having climbed the high rail. The track was but slightly damaged; one rail on the high side of the curve was kinked downward about 1 inch and inward slightly toward the center of the track, at points 2 feet from its north end and 3 feet from its south end; this latter point was 92 feet north of the first marks of derailment and nearly opposite the point where the rear of the derailed locomotive stopped.

An inspection of locomotive 6425 and baggage car 200, to which the locomotive tender was coupled at the time of derailment, was made by inspectors of the Commission; all wheel flanges were found to be in good condition, and all driving boxes were free in their pedestals. The height of the coupler on the rear of the tender, with no water in the tank, was 34 3/8 inches but the carrier iron was bent down-

ward about one inch, and the coupler shank was twisted so that the top of the vertical center line was 3/8ths of an inch to the left. The height of the coupler on the head end of car 200 was 31½ inches, and the shank was twisted so that the top of the vertical center line was moved 1½ inches toward the right side of the tender. There were bruises on the top surface of this coupler and also on the bottom surface of the tender coupler. The contours of the couplers were well within the prescribed limits.

To ascertain the degree of variation in the vertical movement of coupled drawbars when moving around the curve involved, an observation was made of the action of the couplers between the tender and the head car of a passenger train moving around this curve at a speed of from 15 to 18 miles per hour; it was found that the maximum variation of such movement was about 3 inches.

Discussion

The investigation indicates that the derailment was started by the careening toward the right of the tender of engine 6425 as it entered upon the 12° 30' curve of the west leg of the wye; this is evident by the twists in the shanks of the couplers on the rear end of the tender and the head end of the first car, and as a result of this force the engine and tender were overturned toward the outside of the curve. The baggage car became separated from the tender and was derailed on the outside of the curve but did not overturn.

Engine 6425 is equipped with a rectangular tender; measured from the top of the rail, the maximum height of the fuel compartment of the tender is 13 feet 2 inches and that of the water cistern is 10 feet 2 inches; the capacity of the fuel-oil tank is 3,756 gallons and the capacity of the water cistern is 10,000 gallons. A calculation based on oil and water consumption rates of engines on this run of the 6425 class indicates that the oil and the water reservoirs were each about 3/4 full at the time of derailment. Various estimates were made of speed at the time of derailment, the maximum estimate being about 35 miles per hour. The evidence indicates that the train approached the bridge at a speed of 45 or 50 miles per hour, which at the time of the accident was somewhat reduced by a service application of the brakes; the position of the derailed equipment indicates, however, that the speed was still relatively high at the time of derailment. Inspection of the engine and equipment disclosed

no condition that might have contributed to the accident.

The distance between the kinks in the bent rail was 34 feet, and the distance between the center of the trailer wheel and the center of the engine truck bolster of engine 6425 is 33 feet 4 inches; the total weight of the locomotive conditioned for service is 259,000 pounds. These facts indicate that the kinks in the rail resulted when the weight of the locomotive became concentrated at two points on the high rail as the engine was overturning.

Division Engineer Cook stated that according to the rules in effect on this railroad, a speed of 30 miles per hour is the maximum safe speed for trains on a 12° 30' curve having a $2\frac{1}{2}$ inch elevation and that 4 feet 9 inches is the proper gauge for such a curve.

The average schedule speed of train No. 6 between San Antonio and Taylor is 44.8 miles per hour, and the maximum authorized speed for passenger trains in that district is 65 miles per hour, although a further limit of 50 miles per hour is established for passenger trains between mile posts 176 and 184, which includes the vicinity of the point of derailment.

Special instructions in the time table covering speed restrictions in this vicinity read as follows:

"AUSTIN DISTRICT"

"All trains will run at restricted speed between Austin and Wye Switches Colorado River Bridge."

"Austin, City Limits, 6 miles per hour."

The evidence indicates that these instructions have been commonly disregarded. Both the train master and the division engineer said that they had ridden around the curve involved on a number of passenger trains, and the usual speed of such trains was from 15 to 20 miles per hour, and the investigation indicated that this is the usual speed at this point.

Conclusion

This accident was caused by excessive speed on a sharp curve.

Recommendations

It is recommended that measures be taken to enforce a definite, maximum speed limit which will provide an adequate margin of safety for trains on this curve.

Respectfully submitted,

W. J. PATTERSON,

Director.