Inv-2055

INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE

PENNSYLVANIA RAILROAD

MANOR, PA.

MARCH 27, 1936

INVESTIGATION NO. 2055

SUMMARY

Railroad:	Pennsylvania	
Date:	March 27, 1936	
Location:	Manor, Pa.	
Kind of accident:	Buckling, wreckage struck by another train	
Trains involved:	Freight	: Passenger
Train numbers:	NL-1	: No. 36
Engine numbers:	4288-6867	: 5439-262
Consist:	101 cars, caboose	: 13 cars
Speed:	15-20 m.p.h.	: 45-50 m.p.h.
Track:	Mountainous territory, sharp curves, steep grades; 4° left curve, followed by tangent on which accident occurred; grade 0.97 percent descending	
Weather:	Dark and cloudy	
Time:	12:10 a.m.	
Casualties:	3 killed; 11 injured	
Cause:	Slack of freight train ran in and buckled body of car out of train fouling adjacent track directly in front of approaching passenger train.	

To the Commission:

On March 27, 1936, there was a derailment of a freight train on the Pennsylvania Railroad near Manor, Pa., the wreckage being struck by a passenger train traveling in the opposite direction on an adjacent track, which resulted in the death of 3 employees, and the injury of 5 passengers, 1 express messenger, 3 dining car employees, and 2 railroad employees. This accident was investigated in conjunction with the Pennsylvania Public Service Commission.

Location and method of operation

This accident occurred on that part of the main line of the Pittsburgh Division extending between BO Block Station, near Altoona, and Pittsburgh, Pa., a distance of 112.9 miles; in the vicinity of the point of accident this is a four-track line over which trains are operated by time table, train orders and an automatic block and cab-signal system. The tracks, numbered from south to north, are 1, east-bound passenger; 2, east-bound freight; 3, west-bound freight; and 4, west-bound passenger. The freight train involved was westbound on track 3 and the passenger train involved was eastbound on track 2; the point of accident was approximately 1,277 feet east of the station at Manor; approaching the point of accident from the east there is a 4° curve to the left 1,551 feet in length, then 590 feet of tangent, the accident occurring on this tangent at a point 55 feet from its western end. Approaching the point of accident from the west there is a 4° curve to the left 1,400 feet in length, followed by the tangent on which the accident occurred. Approaching the point of accident from the east the grade is descending for more than 2½ miles, varying from 0.68 to 1.12 percent, then it is level for 1,010 feet, ascending for 2,955 feet, varying from 0.50 to 0.76 percent, following which it is descending for more than 2 miles, being 0.97 percent where the accident occurred, this point being approximately 4,060 feet west of the summit of this latter gradient. The track is well maintained.

The automatic signals are located on signal bridges spanning the tracks; the last signal passed by the east-bound passenger train involved was on signal bridge 3292, located 756 feet west of the point of collision. The maximum authorized speed for freight trains is 45 miles per hour; eastbound tracks Nos. 1 and 2 are of the same standard of maintenance in this particular territory and passenger trains are permitted to operate on either of these tracks at a maximum speed of 70 miles per hour.

Inv. No. 2055
Pennsylvania Railroad
Manor, Va.
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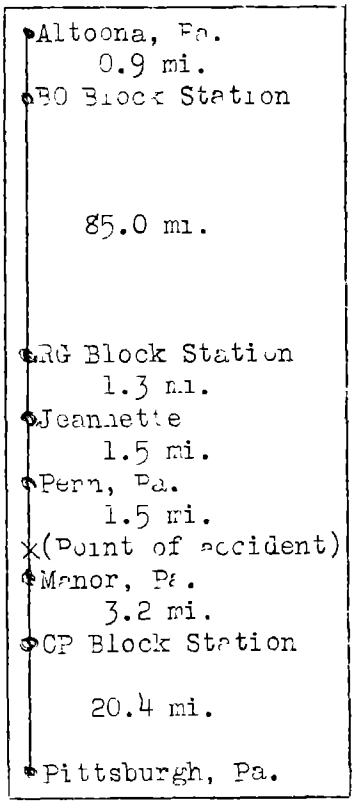

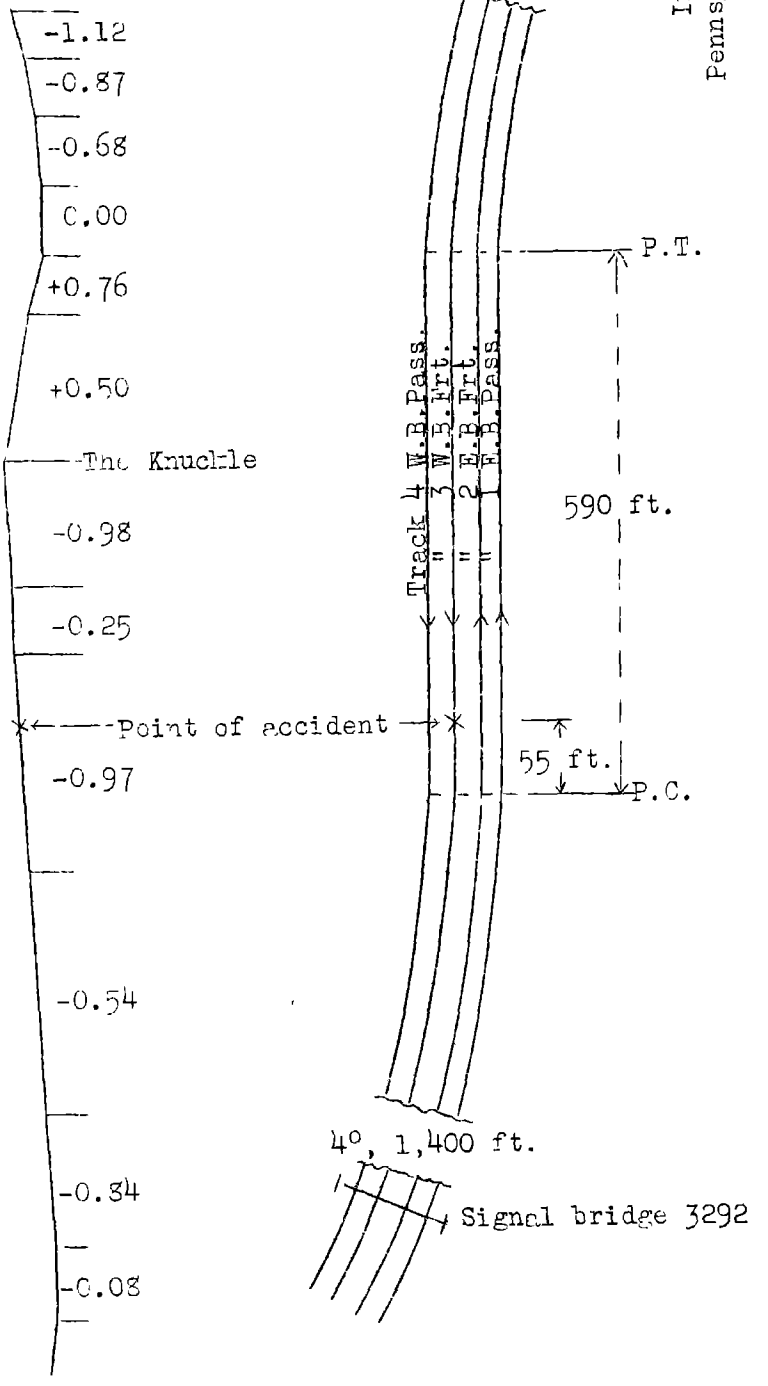

It was dark and cloudy, but visibility was good, at the time of the accident, which occurred about 12:10 a.m.

Description

Train NL-1, a west-bound freight train, consisted in the order named of helper engine 4288, road engine 6867, 53 empty cars, 1 loaded car, 2 empty cars, 45 loaded cars and a caboose, and was in charge of Conductor Haggart, Pilot-Engineman Welshans, and Enginemen Nicol and Romigh, respectively. This train passed RG Block Station, the last open office, at 11:28 p.m., according to the train sheet, stopped at Jeannette, 1.3 miles beyond, where the engines were cut off for water, and while approaching Manor on track 3, moving at an estimated speed of 15 to 20 miles per hour, the train buckled near the middle, causing the fifty-fifth car, S.F.R.D. 12716, an empty refrigerator car, to become dislodged and foul track 2 directly ahead of Train No. 36.

Train No. 36, an east-bound passenger train, consisted in the order named of helper engine 5439, road engine 262, 2 postal cars, 1 express car, 1 refrigerator car, 1 passenger-baggage car, 1 coach, 1 dining car and 6 Pullman sleeping cars, and was in charge of Conductor Johnson and Enginemen Snyder and Kuhn, respectively. The cars were of all steel construction, with the exception of the refrigerator car, which was of steel underframe construction. This train passed CP Block Station, the last open office, at 12:08 a.m., according to the train sheet, 2 minutes late, running on track 2, passed signal bridge 3292, the signals displaying proceed, and on reaching a point 756 feet beyond while traveling at a speed estimated to have been between 45 and 50 miles per hour the lead engine struck the body of the refrigerator car in Train NL-1.

Engines 5439 and 262, together with their tenders, stopped on their right sides, separated from each other, on tracks 1 and 2; the front end of engine 5439 was 516 feet east of the point of collision; the first 8 cars in the passenger train were derailed, but remained upright, the first 5 of these cars stopping in various positions across all four main tracks and a spur track on the south, while the last 3 of these cars remained in line on track 2. The rear truck of the fifty-fourth car, and the fifty-fifth and fifty-sixth cars in Train NL-1 were derailed; the fifty-seventh to the fifty-ninth cars, inclusive, were not derailed and they remained coupled; the rear truck of the sixtieth car and the sixty-first, sixty-second, sixty-third, and the forward truck of the sixty-fourth car were derailed. S.F.R.D. 12716 was demolished. Nearby telephone and power wires were broken and the interruption was automatically recorded at two breaker stations of the West Penn Power Company at 12:10 a.m. The employees killed were the two passenger enginemen and the fireman of engine 262, while the employee injured was the fireman of engine 5439.

Summary of evidence

Fireman Grove, of lead engine 5439 of Train No. 36, stated that the engines of the passenger and freight trains passed each other in the immediate vicinity of Manor station; shortly thereafter, when just east of signal bridge 3292, the signals on which displayed clear, he heard a loud noise like slack running in on the freight train. The headlight on his engine was burning brightly and the freight train was moving in the opposite direction on the track adjacent to his side of the cab; he was looking ahead as his engine rounded the curve immediately west of the tangent involved, and saw the dislodged body of the freight car about four freight car lengths ahead, fouling Track No. 2. Fireman Grove immediately shouted to Engineman Snyder to apply the air brakes in emergency, but before any action could be taken the accident occurred; the cab signal was displaying a clear indication and his train was making about schedule speed at the time.

Flagman Woomer, of Train No. 36, stated that his train was traveling at a speed of about 45 or 50 miles per hour. He was looking out of the rear door of the last car and on reaching a point a short distance east of Manor station he heard a sound as though the passing freight train was making a rough stop; the air brakes on his own train were applied in emergency and when it stopped the freight train had also stopped. Statements of Conductor Johnson and Brakeman Walton developed nothing additional of importance.

Engineman Nicol, of engine 4288, stated that his engine was coupled to Train NL-1 at DR Block Station, located 20.8 miles east of Manor, after which a road test was made of the air brakes; no difficulty was experienced in starting the train and the first stop made was Jeannette, where the engines were cut off for water; after being recoupled another road test of the brakes was made and the train departed. There was no excessive brake-pipe leakage and no brakes were observed to be sticking; the indicator on the air gauge registered 82-pounds brake-pipe pressure, and the speed of the train was about 20 or 25 miles per hour, when he closed the throttle just east of the point of accident; he permitted the train to drift, and did not apply the brakes after closing the throttle as he figured on keeping the train stretched and intended to proceed to CP Block Station and cross-over to track 4 without using the brakes. As his engine passed signal bridge 3292 a clear signal indication was displayed for track 3, and the cab-signals worked properly; he saw Train No. 36 pass on the adjacent track, but heard no unusual sound and the first he knew of anything wrong was when the air brakes were applied in emergency from the rear and the air gauge went to zero, which was followed by an apparent stretch-out and run-in of slack. Engineman Nicol further stated that he knew there were 101 cars in the train, but that he did not know how the loaded and empty cars were distributed, saying that such

information is given to the engineman of east-bound trains only, at Altoona. The manner in which the loads and empties are distributed in a train of this size materially governs the methods of manipulating the brake valve and had he known the make up of his train he would have handled it differently. With the 50 loaded cars on the rear and the empties on the head end there would be a tendency for the slack to run in and he would make a heavier reduction of air when making a brake application on a train of this kind than he would if the loads were on the head end and the empties on the rear, in which case the tendency would be for the train to stretch out. Whenever he makes a brake application he always complies with the rule requiring that a light reduction of 5-pounds be made so as to adjust the speed of the train preparatory for further reductions. Statements of Fireman Wall added nothing of further importance.

Pilot-Engineman Welshans, of the second engine of Train NL-1, said that he took charge of engine 6867 at Conemaugh, 55.2 miles east of Manor; the train stalled at DR Block Station due to a burst air hose, and a helper engine was coupled ahead at that point. Shortly after his engine started to descend the grade just east of Manor, he shut off steam and permitted the engine to drift and soon afterward the engineman of the lead engine did the same; the train was drifting when the accident occurred. He did not notice any brakes sticking when passing signal bridge 3292, but felt the train surge against the engines after passing over the summit of the grade, and later felt a slight jerk shortly after Train No. 36 passed his engine; when the freight engines were about 10 or 12 car lengths west of Manor station the air brakes were applied from the rear, the air gauge indicated zero, and the slack ran-in. The usual brake-pipe pressure of 80 or 82 pounds had been maintained en route, and the speed at the time of accident was about 15 or 20 miles per hour. Statements of Engineman Romigh, Fireman Fawcett and Head Brakeman Kuntz brought out nothing additional of importance.

Conductor Haggart and Flagman Bennett were in the caboose when the accident occurred; the conductor said he examined the track from the caboose to the point of accident, but found no marks to indicate that any of the cars in his train had been derailed prior to the impact.

Statements of car inspectors at Altoona were to the effect that the cars in Train NL-1 were inspected and no defects noted, and that a terminal test was made of the air brakes at that point and they worked properly.

Assistant Master Mechanic Batson stated that refrigerator car S.F.R.D. 12716 was built in April, 1918; its original construction was with all-wooden sills, with the longitudinal center sills re-

inforced by continuous, uncovered, metal channel drafts of 9 inch web and 2 5/8 inch flange, weighing about 25 pounds per foot, secured to which were built-up metal body bolsters and cross bearers of 9 inch channel, with the underframe construction supported by six truss rods. The coupler shanks were 5 x 7 inches and the striking plates were bolted to the wooden sills and continuous drafts. The trucks were Andrews type, cast-steel truck sides, 80,000 pounds capacity, 5 x 9 inch journals, single plate cast iron wheels, cast steel bolsters with "U" section non-friction roller side bearings. He said that the wheels showed very little wear and the flanges were good. In the Simplex coupler on the east end of the car the knuckle pin hole was broken out in the top lug and the face next to the lock block was broken and separated about 1 inch, these were new breaks. The coupler on the west end was of the D-type and was undamaged, but on the rear of the car immediately ahead of S.F.R.D. 12716 the striking plate was broken, the sills were split at the ends, and the draft key bent, which defects seemed to have been caused by a twisting motion; the rear truck of this car was derailed. The car behind S.F.R.D. 12716 was lying on its side across track 4, but was undamaged except for a slight droop of the forward coupler, D-type. The next three cars were on the rails and undamaged, while the following five cars were derailed, two of them being off their trucks and tipped over fouling track 4, the derailment of these five cars apparently being occasioned by the action of the cars in Train No. 36 when the locomotive collided with S.F.R.D. 12716, which probably was the only car of the freight train that fouled track 2 at that time, this conclusion being supported by the position of the car and the fact that parts of the car, including insulation and the ventilator cap from the southwest corner, were lodged on the forward left portion of the leading engine of Train No. 36. He further stated that cars of the type of S.F.R.D. 12716 are considered safe to run in any position in trains and it is his belief that the accident was due to some unexplained slack action of the train, which occurred either at or approaching the point of accident.

Supervisor Sanders stated that he examined track 3 but found nothing that would have caused the trouble to the freight train, and there was nothing to indicate that refrigerator car S.F.R.D. 12716 had been off the track prior to the accident.

Assistant Road Foreman of Engines McCaughey and Assistant Master Mechanic Wright made an examination of both of the derailed passenger locomotives, but found no defect on either that would have contributed to the derailment.

Examination of track 3, made by the Commission's inspectors, for approximately 1 mile east of the point of accident, disclosed nothing to indicate that the freight train was derailed or that

any part of its equipment was dragging. Examination of track 2 also failed to disclose any marks of dragging equipment in Train No. 36. S.F.R.D. 12716 had been moved, but examination verified statements of the assistant master mechanic as to its original construction and as to the damage sustained by the draft members and the car body. Approximately two-thirds of the west portion of the body and sills were demolished and scattered over all tracks. The front truck center pin was bent to a right angle; the continuous metal draft channels remained bolted to both drawbars and were bent double, badly twisted, with the flanges and webs broken at several places. On the east end of the body, which remained intact, a puncture was found 20 inches from the bottom and 8 inches from the south side, from which hole a distinct scar ran diagonally to the roof, terminating 36 inches from the south side. The southwest corner of the car immediately behind S.F.R.D. 12716 was slightly crushed just above the end sill, and at a point 7½ feet above the end sill, and between these points were four indentations spaced about the distance between ladder treads.

On the forward end of engine 5439, the front end rim was indented about 5 inches on the left side and also across the top under the headlight bracket, and the circular hand rail was bent in sharply at the left end; the left smoke box brace was bent above the step and was broken off at the pilot wing casting; the left uncoupler end-casting was sheared off and bore yellow paint marks, while yellow paint marks were also visible on the outer rim of the left forward truck-wheel. The pilot was knocked off and the beam scarred, and the forward end of the left running board was bent downward. Bits of refrigerator insulation and splinters of wood remained at various places on the left side of the engines.

Discussion

The freight train was traveling at a speed of about 20 miles per hour and was passing the passenger train, which was traveling in the opposite direction on the adjacent track at a speed of about 50 miles per hour, when the engines of the freight train were suddenly stopped by the train line parting, followed by a severe run-in of slack. Members of the passenger crew heard the noise of the slack action and a few seconds later their engine collided with the body of the refrigerator car, which the fireman said was fouling the north rail of track 2. Marks of impact on the forward end of the leading engine of Train No. 36, disclosed that the southwest corner of the car was struck by the smoke box at about its center, indicating that the forward end of the car was off its truck and tipped downward at the time of impact. Marks on the rear of this car and on the forward end of the following car showed that the rear end of the refrigerator car was on its truck at the time of collision, but leaning toward track 2, and

that the impetus from the opposing train was transmitted through the canted car to the car behind it, turning the latter car over and at the same time demolishing a large portion of the wooden part of the refrigerator car and bending its continuous draft channels into hair-pin shape. The suddeness and severity of the slack action of the freight train prior to the collision is evidenced by the fact that it was heard by the flagman and the fireman of the passing passenger train. The evidence indicates that the collision occurred during, or a very few seconds after, the surge in the freight train took place, and that refrigerator car S.F.R.D. 12716, which was first struck, was dislodged by the surge and further that the car was struck at about the instant that its forward end reached the ground. In this instance the 46 loaded cars constituted the rear portion, and the 55 empty cars the forward portion of the train; there was testimony to indicate that this make up, together with the two heavy engines at the front of the train retarding momentum, might have been a factor in actuating the run-in of slack. It is noted that with but a few exceptions, the loaded cars contained very light loads. There was no indication of a broken train line or of a derailment prior to the time the car body left its position in the train. The enginemen of the freight train stated that their engines were shut off at about the time the train tipped over the apex of the grade. Apparently the slack in the train immediately commenced to gather, due to the inclination of the cars to move faster than the two engines, which were not equipped with drifting throttles, and this slack action reached the engines shortly after they had passed the passenger train, and was of sufficient force to dislodge the body of the refrigerator car from its proper position.

S.F.R.D. 12716 was of A.A.R. class E-3 construction, with wooden body and wooden underframe, having 9 inch continuous draft channels without cover plates. The wooden sills were not decayed and the car in general was not dilapidated, nor were the draft channels weakened by excessive corrosion. The position of such cars, associated with heavy equipment in modern tonnage trains, especially in mountainous territory, is a matter of considerable import. Although this car was physically sound, yet it failed to withstand the strain exerted upon it in the middle of the long train. Serious consideration should be given to limiting the use of cars without cover plates on the continuous draft members and to their ultimate elimination from unrestricted service, at the earliest practical date.

Conclusion

This accident was caused by the body of refrigerator car S.F.R.D. 12716 buckling out of the middle of freight Train NL-1, due to severe slack action, and fouling the adjacent track directly in front of an approaching passenger train.

Respectfully submitted,

W. J. PATTERSON,

Director.