

INTERSTATE COMMERCE COMMISSION
WASHINGTON

REPORT OF THE DIRECTOR
BUREAU OF SAFETY

ACCIDENT ON THE
CHICAGO GREAT WESTERN RAILROAD

TENNANT, IOWA

FEBRUARY 18, 1939

INVESTIGATION NO. 2333

SUMMARY

Inv-2333

Railroad: Chicago Great Western
Date: February 18, 1939
Location: Tennant, Iowa
Kind of accident: Head-end collision
Trains involved: Passenger :Engine shoving car
Train numbers: 34 :
Engine numbers: 759 : 755
Consist: 5 cars : 1 car
Speed: 40 to 50 m.p.h. : Unknown
Operation: Timetable and train orders
Track: Single; tangent; 0.458 to 0.82 percent descending westward
Weather: Clear
Time: 10:30 p. m.
Casualties: 2 killed, 17 injured
Cause: Failure to secure a car on a grade which resulted in car side-swiping cab of engine, damaging air, hot water and steam connections, causing crew to leave engine without closing throttle and allowing it to move out of control.

April 4, 1939.

To the Commission:

On February 18, 1939, there was a head-end collision between a passenger train and a runaway engine shoving a box car ahead of it, on the Chicago Great Western Railroad near Tennant, Iowa, which resulted in the death of 2 employees and the injury of 2 employees, 4 persons carried under contract, and 11 passengers. This accident was investigated in conjunction with a representative of the Iowa State Commerce Commission.

Location and Method of Operation

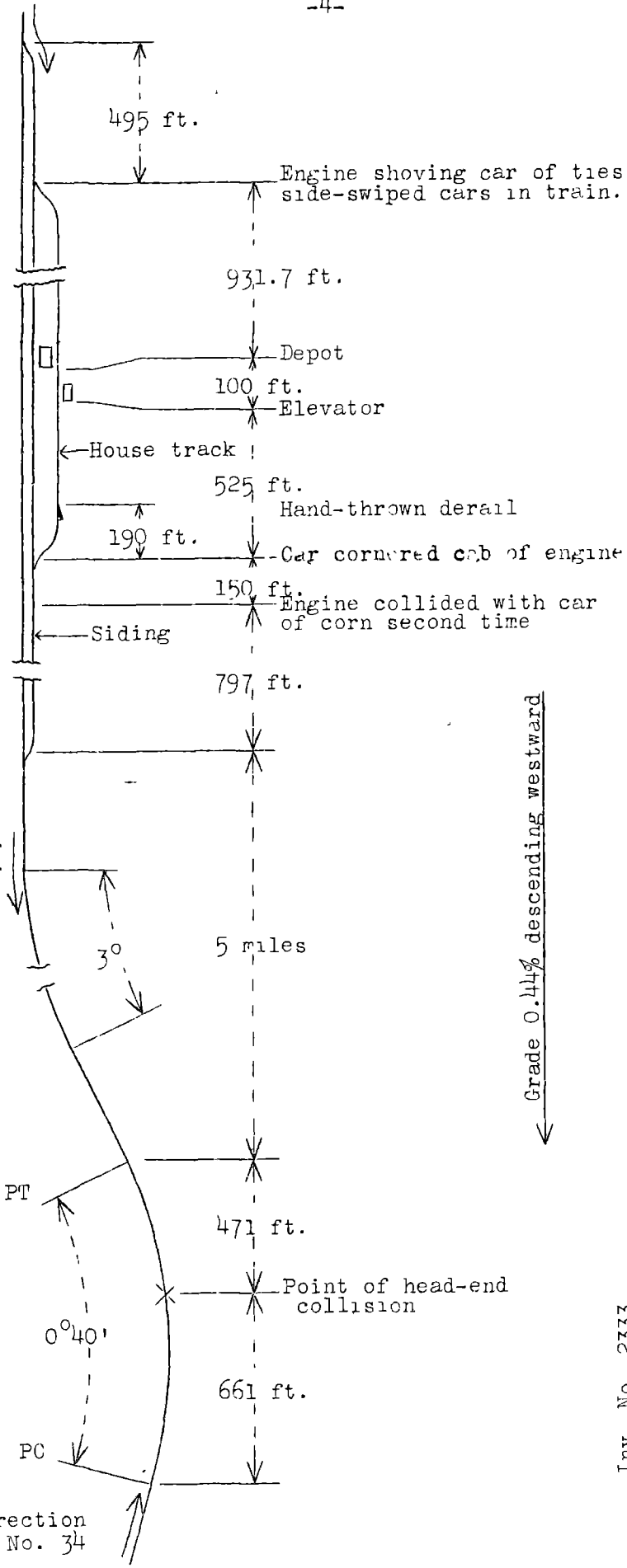
This accident occurred on that part of the Minnesota Division designated as the Seventeenth District which extends between Carroll and Council Bluffs, Iowa, a distance of 83.8 miles; this is a single-track line over which trains are operated by time-table and train orders, no block-signal system being in use. At Tennant, a siding 2,998.7 feet long parallels the main track on the south, and a house track 1,557 feet long, both ends of which are connected with the siding, parallels the siding on the south at a distance of about 60 feet. The east house-track switch is located 495 feet west of the east siding-switch; the west house-track switch, equipped with a No. 10 turn-out and a hand-throw derail, is located 947 feet east of the west siding-switch and the derail is 190 feet east of the switch. An elevator is located about 525 feet east of the west house-track switch and south of the house track; the depot, at which no one was on duty at the time of the accident, is located between the siding and the house track and about 625 feet east of the west switch of the house track.

Westward from the east siding-switch at Tennant there is a tangent 6,042 feet long followed by a 3° curve to the left 1,695 feet long, then a series of curves and tangents followed by a $0^{\circ}40'$ curve to the right 471 feet to the point of the collision and 661 feet beyond, then a tangent of more than 8,000 feet. From a point about 850 feet east of the east siding-switch at Tennant, the grade for west-bound trains is 0.10 percent ascending a distance of 900 feet, then 0.12 percent descending a distance of 1,330 feet, 0.44 percent descending a distance of 900 feet, then a maximum of 0.82 percent and an average of 0.458 percent descending to the point of the collision, about 5 miles west of Tennant, from which point the grade is an average of about 0.35 percent descending a distance of about 8,000 feet.

The maximum authorized speed for passenger trains in the territory involved is 50 miles per hour.

Direction
of No. 81

o	Carroll, Iowa	
		40.3 mi.
o	Harlan	
		8.2 mi.
X	Tennant (Point of 1st three collisions.)	
		5.0 mi.
X	Point of head- end collision	
		1.3 mi.
o	Magill	
		29.0 mi.
o	Council Bluffs, Iowa	



Direction of
engine and car

Grade 0.44% descending westward



Direction
of No. 34

Inv. No. 2333
Chicago Great Western R.R.
Tennant, Iowa
February 18, 1939.

The weather was clear and dark at the time of the accident, which occurred at 10:30 p. m.

Description

No. 81, a west-bound second-class freight train, consisted of 56 cars and a caboose, hauled by engine 755, and was in charge of Conductor Walsh and Engineman Anderson. This train departed from Carroll, 48.5 miles east of Tennant, at 7:59 p.m., according to the train sheet, 1 hour 49 minutes late, and at Harlan, the last open office and 8.2 miles east of Tennant, the crew received train order No. 63, Form 19, reading, "No. 34, eng. 759 wait at Magill until 10:15 p. m. Tennant 10:25 p. m. for No. 81 eng. 755." This train departed from Harlan at 9:35 p. m. and entered the siding at Tennant about 10:10 p. m., according to the testimony, and stopped clear of the west house-track switch to pick up a car of corn which stood on the house track behind a car of ties. After pulling the two cars from the house track and "kicking" the car of corn up the siding toward their train, the engine was shoving the car of ties back to spot it on the house track when the cab was cornered by the car of corn which had rolled back, breaking a steam pipe and pipes leading to and from the distributing valve in the cab. The engine crew were forced to leave the engine which, with its throttle still partly open and shoving the car of ties, continued its backward movement until it collided with that part of its train fouling the east house-track switch. The impact was sufficient to cause the reverse gear to shift to the opposite position and the engine, having become uncoupled from the car of ties, moved forward through the house track to the siding where, having attained a speed of about 30 miles per hour, it collided with the car of corn which had in the meantime rolled westward through the west house-track switch to a point about 150 feet beyond; from that point the engine, shoving the car of corn ahead of it, moved westward through the west siding-switch to the main track and proceeded to a point about 5 miles west of Tennant where it collided with No. 34 while traveling at an undetermined rate of speed.

No. 34, a west-bound passenger train, consisted of two baggage cars, one postal car, one coach and one Pullman sleeping car, in the order named, all of all-steel construction, hauled by engine 759, and was in charge of Conductor Hart and Engineman Miller. This train departed from Council Bluffs at 9:42 p. m., after having received a copy of train order No. 63 previously quoted, passed Magill, about 29 miles east of Council Bluffs, at 10:28 p. m., according to the testimony, and at a point about 1 mile east of Magill, while traveling at a speed estimated to have been between 40 and 50 miles per hour, it collided with engine 755 shoving the car of corn.

The unbroken windows from the north side of the cab of engine 755, sheared nuts, broken bolts and pieces of asbestos were found between the house track and the siding near the fouling point of the west house-track switch where the first collision between the engine cab and the car of corn occurred. In the collision at the east house-track switch the east end of the twenty-ninth car in the train was derailed and badly damaged, and the thirtieth and thirty-first cars, into which the car of ties was telescoped, were tipped over and demolished. The point of the third collision was indicated by marks on the ties where the front coupler of the engine had dropped to the ties and was dragged to the frog of the west siding-switch; car parts and corn were scattered from the point of this collision to the location of the collision with the passenger train.

At the point of the final collision the car of corn was demolished; engine 755 stopped on the north side of the track leaning toward the south, its front end about 20 feet and its rear end about 10 feet from the rail; its tender remained upright and stopped derailed about 50 feet east of the engine. Engine 759, of train No. 34, stopped on its right side facing west, its head end about 5½ feet and its rear end about 10 feet from the north rail; both engines were demolished. The first baggage car stopped on its right side south of and parallel to the track, and opposite engine 759, with the tender telescoped into it. No other equipment was damaged.

Engine 755 was a U.S.R.A. 2-8-2 stoker-fired engine equipped with ET-6 brake equipment, Walschaert valve gear, Ragonnet type "B" power reverse located under the running board in front of the right corner of the fire box, and a hydrostatic lubricator located on the right back boiler head; the total weight of the engine was 477,400 pounds and it carried a steam pressure of 200 pounds. The lubricator steam pipe led from the condenser near the top of the cab to a connection below the crown sheet on the left back boiler-head. The distributing valve, secured by brackets, was located directly under the right side of the cab.

The employees killed were the engineman and the fireman of No. 34, and the employees injured were the brakeman of No. 34 and the engineman of No. 81.

Summary of Evidence

Engineman Anderson, of No. 81, stated that he held train order No. 63 directing No. 34 to wait at Magill until 10:15 p.m. and Tennant until 10:25 p.m. for No. 81. His train entered the siding at Tennant at 10:05 or 10:06 p.m. but stopped clear of the west house-track switch to pick up a car of corn which was behind a car of ties on the house track, after which he expected to saw by No. 34. They pulled the two cars out of the house track and then kicked the car of corn up the siding toward their

train but, as it did not move freely, it was necessary to give it a second shove for it to reach and couple to the train; the car of ties then was shoved toward its original location on the house track and they slowly backed through the switch, working a light throttle and with the reverse lever well back. From his position on the seat box, looking back over his right shoulder, he saw the brakeman on the east stirrup of the car and as the engine was about at the frog he suddenly became aware that the car of corn was at the cab window and almost instantly he felt scalding water in his face. Before attempting to get out of the cab window, he made an effort to reach the brake valve but did not close the throttle. As there was not sufficient room between the cab window and the car for him to make his escape, he crawled out through the gangway and dropped to the ground on his hands and knees. Realizing that the engine was still moving, he attempted to crawl along in the direction in which it was moving and, seeing the fireman, he shouted to him to stop the engine, whereupon the fireman gave chase. He stated that the engine was functioning properly and it was his opinion that the steam pipes had not broken at the fountain as it was hot water that struck him in the face. He said that he first hesitated to back into the house track to re-spot the car of ties because he had not seen the brakeman release or set any brakes on the car of corn or take any other precautions to prevent it rolling back upon them, but since cars spotted for loading usually have their brakes applied and as this car would not roll freely he thought the brakes must already be set and that the brakeman was aware of it.

Fireman Sharp, of No. 81, stated that en route to Tennant the engine was in good condition and the brakes functioned properly. After kicking the car of corn up the siding and seeing that it did not clear the fouling point of the switch he saw the head brakeman signal to give the car a second shove. After the second shove was made the engine, with its headlight burning and shoving the car of ties, was moving into the house track at a speed of 5 to 7 miles per hour when there seemed to be a sudden burst of steam above the boiler head. He was on the deck of the engine examining the coal conveyor and did not feel or hear an impact, although he was thrown to the coal pile, after which he made his way from the engine over the rear of the tender, descending on the engineman's side where he found the engineman on the ground. He said that at this time the engine was standing but it started moving almost immediately and when the engineman shouted to him to stop the engine, he made an unsuccessful attempt to overtake it but he saw the head brakeman board it. After the impact at the east end of the house track, which he heard from a position near the depot, the engine seemed to slip a few times and then it started forward under what he thought was a full head of steam, passing him at a speed of about 30 miles per hour. It did not occur to him to throw the house-track derail.

Head Brakeman Brown stated that his train entered the siding at Tennant about 10:05 p. m., stopping about two car lengths east of the west house-track switch. When pulling out the car of corn and the car of ties he did not notice whether the brakes were set on either car but as the car of corn would not move freely when kicked toward the train he thought that they were set although there was no sound to indicate that such was the case. While re-spotting the car of ties on the house track he gave no further attention to the car of corn although he was aware that such cars, when free, would roll westward; he was on the east stirrup of the car of ties and on the engineman's side when the engine stopped suddenly and he saw steam coming from the cab, but he did not see the car of corn at this time. The engine then started backward and he boarded the steps on the engineman's side not knowing that the engine was unmanned; finding it impossible to enter the cab because of steam and water and as the engine was rapidly increasing its speed, he jumped off. He was near the depot when the engine returned through the house track after colliding with the side of the train at the east end of that track, but he did not observe whether the headlight was burning although he observed that it was burning previous to this. After the side collision at the east end of the house track and after he realized the engine was returning through that track, he did not think that he would have had time to throw the derail had he had the presence of mind to do so. He said that he did not comply with the rule which requires that when leaving cars on a side track or when separating a train at a crossing hand brakes on all such cars must be securely set and if necessary cars must be blocked.

Conductor Walsh, of No. 81, stated that he had instructions to pick up a car at Tennant; the head end of the train was pulled into the siding there, and while he remained to protect the rear end, the rear brakeman went ahead to protect against No. 34 for that part of the rear portion of the train remaining on the main track. He said that soon thereafter, when hearing some one from the direction of the head end call him, he left a red light and a lighted fusee, went ahead and learned what had happened; he notified the dispatcher through the local telephone exchange. He thought the head brakeman was sufficiently experienced and he considered him to be careful in his work.

Rear Brakeman Mehren, of No. 81, stated that after arriving at Tennant he went forward on the main track to inspect the train and, while so engaged, heard an engine working steam which he thought was No. 34 coming up the hill without a headlight burning and then not seeing the car of corn he thought that it had gotten away and the engine was chasing it. He said that he did not hear either the engine run through the house track or the crash when the cars were side-swiped at the east house-track switch. He thought the head brakeman had had enough experience to handle the work at Tennant.

Conductor Hart, of No. 34, stated that he held train order No. 63 directing his train to wait at Magill until 10:15 p.m. and at Tennant until 10:25 p.m.; it was 10:23 p.m. when they passed Magill at a speed of 40 or 50 miles per hour. Immediately after passing Magill, the brakeman pulled the communicating cord calling the engineman's attention to the wait order at Tennant although the time of the restriction had already expired; this signal was answered by the engineman. The conductor estimated the time of the collision at 10:30 p.m. and stated that there was no brake application or reduction of speed prior to the impact. He thought that the box car ahead of the runaway engine obscured the headlight and his engine crew had no warning of the impending collision.

Train Master Halverson stated that he arrived at Tennant about 11 hours after the accident occurred and found four cars derailed at the east switch of the house track. Two of these were tipped over parallel to and fouling the main track, the east end of a tank car was derailed and the car of ties was telescoped into the other three cars. About 110 feet east of the west house-track switch there was a pile of coal dust covering an area of about 15 square feet, and there were nuts and asbestos scattered between the siding and the house track, indicating that the side collision between the car of corn and the cab of the engine had occurred at that point. About 100 feet westward from the switch a rerailing frog was lying between the siding and the main track and there was a quantity of corn scattered on the south side. Marks between the rails from that point to the frog of the west siding-switch indicated that a draw-head had been dragged, and at the frog he found the head of the front coupler of engine 755. There was shelled corn and an occasional piece of iron scattered from this point to the point of the final collision, about 5 miles west of Tennant.

Superintendent of Motive Power Olson stated that he thought the damage to the power reverse gear, the main supply, the application, and the release pipes, which are on the outside of the cab, resulted from the first collision with the car of corn; the breaking of these pipes would cause a heavy flow of air through the main reservoir which would tend to deplete the air supply and if this were sufficiently depleted the power reverse would not be controlled by air pressure and this, in turn, would cause the engine and tender brakes to be inoperative; if applied previously they would be released immediately.

Master Mechanic Becker stated that, in his opinion, in the first collision with the car of corn the distributing valve brackets which are located near the right cab support sheets and the pipe connections which are practically flush with the outside of the cab were knocked loose; this depleted the air supply and caused the engine to stop momentarily although its supply of steam was not shut off; the power reverse still had sufficient air

pressure to hold it in position until the engine started or possibly until it side-swiped the rear end of the train, then, due to the brakes being bled off and the pipe connections damaged, there was nothing to control the position of the power reverse gear which was in backward motion. When the engine and car side swiped the cars at the east end of the house track the link too the forward position and could, by gravity, pull the radius and reverse rods down into forward position; this would occur regardless of the position of the reverse lever. He thought that the first collision knocked the water column drain pipe loose and that water from this source struck the engineman in the face.

Road Foreman of Engines Stahley corroborated the statement of Master Mechanic Becker relative to the evidence of the side collision at the west house-track switch and the point where the engine collided with the car of corn the second time; it was his conclusion that the car of corn, after scraping the side of the tender at the west house-track switch, next contacted the roof of the cab and the resulting shift of the steel cab caused the damage; he thought that the reversing gear also was damaged at that time.

Discussion

According to the evidence No. 81 had instructions to pick up a car of corn at Tennant. The head end of the train was pulled into the siding but clear of the west house-track switch at Tennant where they intended to clear for No. 34. As the car of corn was behind a car of ties, both cars were pulled out and the car of corn was kicked toward the train on the siding; as the engine was returning the car of ties to the house track at a speed of 5 to 7 miles per hour, at the fouling point of the switch its tender and cab were side-swiped by the car of corn moving on a descending grade as it had not become coupled to the train and its brakes had not been set. The steam and hot water pipes in the cab were broken in the collision and the escaping steam and hot water forced the engine crew to leave the engine immediately without closing the throttle.

According to the opinion of mechanical officials the distributing valve and pipe connections were knocked loose, which depleted the air supply. After a momentary stop, the engine continued its backward movement through the house track, during which movement the brakeman boarded it on the engineman's side, and not knowing that it was unmanned, jumped off again when finding that steam and hot water prevented him from entering the cab. The fireman also unsuccessfully attempted to catch the engine which continued its backward movement until it collided with that part of the train standing on the east house-track switch; the impact of this collision caused the engine to reverse its direction and, returning through the house track apparently under a good head of steam, it again collided with the car of corn

which, in the meantime, had rolled westward through the house-track switch; then the engine shoved this car through the siding switch to the main track and traveled westward about 5 miles where it collided with No. 34.

The speed of the engine shoving the car of ties at the time of the second collision could not be determined, although the force of the impact was sufficient to derail three cars in No. 81, two of which were demolished. The speed at the time of the third collision was estimated to have been about 30 miles per hour and the exhaust indicated that the engine was working steam; although the speed of this engine at the point of collision with No. 34 cannot be determined, it is probable that it was considerably more than 30 miles per hour as the grade was descending the entire distance. The speed of No. 34 was estimated at 40 to 50 miles per hour. Since no brake application on No. 34 was made, it is apparent that the engine crew had no warning of the approach of the runaway engine.

In picking up the car of corn the movement was hurried in order to clear for No. 34. This apparently resulted in hurriedly kicking the car of corn toward the train on the siding which had a gradient of 0.44 percent descending for westward trains, and as it did not move freely it was given a second shove to clear the fouling point of the switch; the brakeman, assuming that it would stand without further measures, again set the switch and gave the signal for a backward movement to the house track; it was while the engine was making this latter movement that its tender and cab were cornered by the car of corn which had rolled back and fouled the switch. The engineman's testimony indicates that he at first hesitated to make the backward movement into the house track, fearing that the car of corn was not secured on the siding but then he thought that in all probability the brakeman knew that the brakes were set or the car was secured in some other manner. Rule No. 801 reads in part, "When leaving cars upon a side track, *** hand brakes on all such cars must be securely set and, if necessary, cars must be blocked." It would seem that the literal meaning of this rule was directed toward the practice of leaving cars on industrial and other tracks for loading, unloading and storage purposes, but the head brakeman stated that he had violated this rule in the manner in which he handled the car of corn at Tennant. His testimony was also to the effect that he released no brakes on the car and that he did not observe how it had been secured on the house track before it was moved and that its brakes did not make any sound when shifting it out because it did not move freely when being kicked toward the train on the siding, he assumed that it would stand. The brakeman thought that he did not have sufficient time to throw the derail after he realized the engine was returning through the house track, had he had the presence of mind to do so.

According to opinions of mechanical officials, the power reverse gear was damaged to such an extent in the first collision that the force of the impact in the second collision caused the link to take the forward position which would, by gravity, pull the radius and reverse rods down into forward position.

Conclusion

This accident was caused by failure to secure a car on a grade, which resulted in the car side-swiping the cab of the engine, damaging air, steam and hot water connections which compelled the engine crew to leave engine without closing the throttle, and allowing the engine to move out of control.

Respectfully submitted,

W. J. PATTERSON,

Director.