

RAILROAD ACCIDENT INVESTIGATION

REPORT No. 4140

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THE TEXAS AND PACIFIC RAILWAY COMPANY

TYE, TEXAS

DECEMBER 27, 1967

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DEPARTMENT OF TRANSPORTATION  
FEDERAL RAILROAD ADMINISTRATION

Washington, D C 20591

Summary

DATE: December 27, 1967

RAILROAD: Texas and Pacific

MOTOR CARRIER: Crown-Tex  
Petroleum Co  
Inc

LOCATION: Tye, Texas

KIND OF ACCIDENT: Collision

EQUIPMENT INVOLVED: Freight train                      Motortruck

TRAIN: No 61

LOCOMOTIVE NUMBERS: Diesel-electric units  
614, 640, 612, MP633,  
604

CONSISTS: 62 cars, caboose                      Tractor, semi-  
trailer

ESTIMATED SPEEDS: 50-60 m p h                      30-35 m p h

OPERATION: Timetable, train  
orders, automatic  
block-signal system

TRACK: Single; tangent;  
0 72 percent descend-  
ing grade westward

HIGHWAY: Two-lane; tangent; level  
crosses track at angle  
of 90°00'

WEATHER: Clear

TIME: 8:05 p m , dark

CASUALTIES: 1 killed; 4 injured

CAUSE: Failure of the truck driver to  
stop his vehicle short of the cross-  
ing and to remain standing until the  
closely approaching train had passed,  
as required by Texas State law and  
Federal motor carrier safety regula-  
tions

DEPARTMENT OF TRANSPORTATION  
FEDERAL RAILROAD ADMINISTRATION  
RAILROAD SAFETY BOARD

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Synopsis

On December 27, 1967, a Texas and Pacific Railway freight train struck a motortruck loaded with gasoline at a rail-highway grade crossing at Tye, Texas. The truck driver was killed, and four crew members of the train were injured.

The accident was caused by failure of the truck driver to stop his vehicle short of the crossing and to remain standing until the closely approaching train had passed, as required by Texas State law and Federal motor carrier safety regulations \*

\*The Federal Railroad Administration has no jurisdiction over railroad operating rules; track structures; bridges; rail-highway grade crossing protection; track clearances; consist of train crews; qualifications or physical condition of railroad employees; running and draft gear on cars, or the construction of cars except those appurtenances within jurisdiction of the Safety Appliances Act and the Power Brake Law of 1958

### Location of Accident and Method of Operation

The accident occurred on that part of the Rio Grande Division extending between Fort Worth and Big Spring, Texas, a distance of 267.5 miles. In the accident area this is a single-track line over which trains operate by timetable, train orders, and an automatic block-signal system. At Tye, 169.1 miles west of Fort Worth, a siding of considerable length parallels the main track on the north.

The collision occurred on the main track, 2,241 feet east of the Tye station sign, where the main track and siding are crossed at grade by FM Road 707.

#### Main Track

From the east, the main track is tangent 1.6 miles to the crossing and a considerable distance westward. The grade, from the east, is 0.74 percent ascending 1,500 feet, a vertical curve 400 feet, and 0.72 percent descending 550 feet to the crossing and a short distance westward.

#### FM Road 707

The road, a two-lane public highway, is paved with bituminous material to a width of 25 feet. It is tangent throughout a considerable distance south of the crossing, and crosses the railroad at an angle of 90°00'. The grade, from the south, is 0.48 percent descending 300 feet, 0.65 percent descending 90 feet, level 10 feet to the crossing, and level over the crossing and 20 feet northward.

#### Crossing

The crossing is 32 feet wide. Planking is laid between the rails of the main track and of the siding, and on the outside of each rail. The remaining area is surfaced with bituminous material to the level of the tops of the planking and rails.

#### Crossing Protection

A circular railroad-crossing advance-warning sign, 30 inches in diameter, is adjacent to the east side of FM Road 707, 432 feet south of the crossing. A standard automatic crossing-warning signal of the flashing red-light type is adjacent to the east side of the road, 12 feet south of the main track. Similar protection, for southbound highway traffic, is provided at the southward approach of the road to the crossing.

The circuits of the automatic crossing-warning signals are so arranged that when a westbound train on the main track reaches a point 2,453 feet east of the crossing, the red lamps of the signals start to flash and a bell on one of the signal masts starts to ring. These devices continue to function until the train has moved entirely over the cross-

ing The red lamps and crossing bell also function when the siding is occupied at any point a short distance east or west of the crossing

#### Traffic at Crossing

During the 30-day period preceding the accident, the average daily railroad movement over the crossing was 6 6 trains In the 24-hour period beginning 2:00 p m , January 17, 1968, 1,118 highway vehicles moved over the crossing

#### View in Crossing Area

As a northbound vehicle on FM Road 707 approaches the crossing within a few hundred feet, the driver has an unobstructed view of any westbound train approaching within a distance of several hundred feet

#### Time and Weather

The collision occurred at 8:05 p m , in darkness and under clear weather conditions

#### Maximum Authorized Speed

The maximum authorized speed for freight trains in the accident area is 60 miles per hour, as prescribed by the railroad carrier

The maximum authorized speed for the motortruck involved, as it approached the crossing within 200 feet, was 20 miles per hour, as prescribed by Texas State law

#### The Accident

##### Train No. 61

No 61, a westbound first-class freight train consisting of 5 road-switcher type diesel-electric units, 62 cars and a caboose, left Lancaster Yard, Fort Worth, at 4:13 p m the day of the accident, after receiving the prescribed brake test After stopping at a crew-change point, the train continued westward and passed Clyde, 146 9 miles west of Fort Worth, at 7:37 p m , 4 hours 57 minutes late About 28 minutes later, while moving at 50 to 60 miles per hour, as variously estimated by the crew members, it approached Tye and the point where FM Road 707 crosses the railroad at grade The engineer, fireman, and front brakeman were in the control compartment at the front of the first diesel-electric unit; the flagman was in the control compartment of the second unit, and the conductor was in the caboose According to the crew members on the first diesel-electric unit, the headlight was lighted and the locomotive bell was ringing

The engineer's statements indicate that he began sounding the locomotive horn as the train neared the crossing-whistle sign located 2,415 feet east of the crossing, and that he continued to sound the prescribed signal on the horn throughout the approach of the train to the crossing The

fireman and front brakeman said they noticed that the red lamps of the automatic crossing-warning signals were flashing as their train neared the crossing and, apparently about the same time, they also noticed that a northbound motortruck on FM Road 707 was approaching the crossing. According to the fireman, the truck was 250 to 300 feet from the crossing when he first saw it. He said the beam of the headlight enabled him to see the driver as the truck neared the tracks. He further said that the driver was sitting erect in the cab of the motortruck, looking straight ahead, and that he did not see the driver make any move to stop or turn the truck while approaching the crossing. Soon after they first observed the motortruck, the fireman and front brakeman saw that its speed was not being reduced and that it was going to enter the crossing immediately in front of the train. Realizing a collision was imminent, the fireman called a warning and the engineer applied the train brakes in emergency. The truck, a tractor and semitrailer loaded with gasoline, proceeded onto the crossing, without stopping, immediately in front of the locomotive. A moment or two later, before its speed was reduced, the train entered the crossing and struck the truck on its right side at the front of the semitrailer, rupturing the tank of the semitrailer. The gasoline cargo of the truck erupted into flames with explosive force, spreading fire over the crossing area, the truck semitrailer, and the train locomotive, causing an explosion in the engine compartment of the first locomotive unit. The fuel in the tank of the truck tractor also ignited as a result of the impact, causing fire to spread over the tractor.

#### Train Damage

The train stopped with the front end 2,337 feet west of the collision point. The front wheels of the front truck of the second diesel-electric unit were derailed. The first and second diesel-electric units were heavily damaged by the impact and fire, and the other three units were slightly damaged by fire. In addition, one car was heavily damaged by fire. According to the carrier's estimate, the monetary damage to the aforesaid equipment was \$179,700.

#### Casualties

The truck driver was killed. The train engineer, fireman, front brakeman, and flagman were injured.

#### Motortruck

The truck was owned and operated by Crown-Tex Petroleum, Inc., of Abilene, Texas, a private carrier engaged in the transportation of petroleum products, including gasoline, in the State of Texas and nearby States. The truck and its driver were subject to the Motor Carrier Safety Regulations of the Federal Highway Administration. It consisted of a 1968 Ford tractor of the cab-over-engine type, and a J&L semitrailer of the tank type. The cab of the tractor was equipped with a sleeping compartment. The tractor had a 350-horsepower diesel engine, and both it and the semitrailer had tandem rear axles with dual wheels. The combi-

nation vehicle was provided with air brakes throughout, and its overall length was 49½ feet. At the time of the accident, it was transporting 8,000 gallons of gasoline. Its gross weight was about 72,000 pounds.

The driver, age 46, resided in Abilene and held valid Texas Commercial Operators License No. 705551. He had been employed by Crown-Tex Petroleum, Inc. since April 1, 1966, and had passed a physical examination on March 6, 1967. He had a good driving record and was considered by officials of the motor carrier to be a highly competent and conscientious employee with no bad habits.

#### History of Truck Movement

The best information available indicates that the driver did not work on December 25th, two days prior to the accident, and that he went on duty in Abilene some time during the morning of December 26th, the day before the accident, and that he then drove the truck as follows:

- (a) Empty, from Abilene to Caddo, about 71 miles
- (b) Loaded, from Caddo to Tye, about 78 miles
- (c) Empty, from Tye to Silver City, about 80 miles
- (d) Loaded, from Silver City to Texas City, about 400 miles
- (e) Empty, Texas City to Houston, about 50 miles

On reaching Houston, the truck proceeded to the plant of the Petro-Tex Chemical Corporation, where plant employees began loading the semitrailer at 1:41 a. m., December 27th, according to a weighing record. This record indicates that the truck left the plant at 8:45 a. m., December 27th, the day of the accident, with a cargo consigned to the motor carrier's blending plant at Tye, a distance of about 350 miles. The truck apparently reached the Tye blending plant 7 4 miles from the crossing where the collision occurred, some time in the afternoon. Its semitrailer was then unloaded and reloaded with a cargo of 8,000 gallons of gasoline consigned for delivery the next day, after a stopover at the motor carrier's headquarters in Abilene.

The truck apparently left the Tye blending plant about 7:55 p. m. It then entered FM Road 707 and proceeded northward en route to Abilene, via the crossing involved. The truck approached the crossing at relatively high speed, and at this time the horn and bell of No. 61 were sounding, and the red lamps and bell of the railroad-crossing warning signals were indicating the close approach of the train to the crossing. In addition, the train headlight was illuminated and was visible to the truck driver. The truck, however, continued northward onto the crossing immediately in front of the closely approaching train and was struck on its right side, apparently at the point where the tractor was attached to the semitrailer.

### Truck Damages

The tractor was torn loose from the semitrailer. It stopped on the north side of the main track, 247 feet west of the crossing, and was destroyed. The semitrailer stopped upside down on the south side of the main track, 111 feet west of the crossing. It was also destroyed.

### Witness Observations

Shortly before the accident, an eastbound local freight train entered the siding at Tye to meet No. 61. It stopped on the siding with the rear end about 200 feet east of the FM Road 707 crossing and clear of the siding track circuit associated with the automatic railroad-crossing warning signals. Hence, these signals stopped functioning shortly after the train moved over the crossing. The flagman of that train said he was standing in the vicinity of the crossing when No. 61 approached. At that time, according to his statements, he saw that the headlight of No. 61 was lighted; heard the horn of the approaching train being sounded; saw the red lamps of the automatic crossing signals flashing, and heard the crossing-bell ringing. According to his statements, when No. 61 was about 900 feet from the crossing, the flagman noticed the truck involved approaching the crossing from the south at a distance of about 450 feet and at a speed which he estimated as 30 to 35 miles per hour. A few moments later, he noticed that the truck was not reducing speed and saw that it was going to enter the crossing, without stopping, immediately in front of No. 61. Realizing that a collision was imminent, he started to run eastward from the crossing. The collision occurred while he was running to safety.

### Post-Accident Examinations

No skid marks were found on FM Road 707 at its northward approach to the crossing.

A test revealed that the automatic railroad-crossing warning signals were functioning properly.

### Train Crews Hours of Service

According to the railroad carrier's records, the engineer, fireman, front brakeman and flagman of No. 61 had been on duty 6 hours 50 minutes in the aggregate at the time of the accident, and the conductor had been on duty 7 hours 5 minutes in the aggregate. All five crew members had previously been off duty 16 hours or more.

### Truck Driver's Hours of Service

Accurate information relative to the driver's hours-of-service, or driving time, prior to the accident was not available. See "Analysis of Accident" for comments concerning the driver's tours of duty on the day of the accident and the day before.



Texas Motor Vehicle Law

The following vehicles must stop at all grade crossings:

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Vehicles carrying explosives or flammable liquids must reduce speed at railroad crossings to 20 miles per hour within 200 feet of the crossing and the driver of such vehicle shall listen and look in both directions along the railroad track for any approaching train. If signals indicate the approach of a train, a positive stop must be made, except when a police officer or traffic control signal directs the traffic to proceed (6701d, Sec 89)

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Federal Motor Carrier Safety Regulations

Regulations of the Federal Highway Administration, Department of Transportation, read in part as follows:

Section 292.10 Railroad grade crossings; stopping required

(a) \*\*\* The driver of any motor vehicle described in subparagraphs (1) through (6) of this paragraph, before crossing at grade any track or tracks of a railroad, shall stop such vehicle within 50 feet, but not less than 15 feet from the nearest rail of such railroad, and while so stopped shall listen and look in both directions along such track for any approaching train, and shall not proceed until such precautions have been taken and until he has ascertained that the course is clear

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(3) Every motor vehicle which, in accordance with the regulations of the Department of Transportation, is required to be marked or placarded with one of the following markings:

\*\*\*

IV Flammable

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(Note: Under Section 177.823(b)(2) of the Department of Transportation's Hazardous Material Regulations, the aforesaid motor vehicle, if carrying gasoline, may be placarded or marked "Gasoline" in lieu of "Flammable").

Analysis of Accident

No 61 approached the crossing at 50 to 60 miles per hour with its headlight lighted, and with its locomotive horn and bell sounding as warnings to traffic on FM Road 707. In addition, the automatic railroad-crossing warning

signals were indicating the approach of a train. The fireman and front brakeman on the train locomotive first saw the motortruck as it approached the crossing at 250 to 300 feet, then saw it near the crossing at unreduced speed. Soon afterward, upon realizing that the motortruck was not going to stop short of the tracks and that it was going to enter the crossing immediately in front of the train, the fireman called a warning and the engineer promptly applied the train brakes in emergency. However, due to its speed and its proximity to the crossing at the time of the emergency brake application, the train entered the crossing and struck the truck before its speed could be reduced.

The motortruck apparently approached the crossing at 30 to 35 miles per hour and did not reduce speed to 20 miles per hour while nearing the crossing within 200 feet, as required by Texas State law. Although the driver had an unobstructed view of the closely approaching train as his vehicle neared the crossing, and the train horn and bell were sounding and the automatic crossing signals were indicating the close approach of the train, he apparently took no action to stop his vehicle short of the crossing, as dictated by prudence and as required by Texas State law and Federal motor carrier safety regulations. Failing to stop short of the crossing, the motortruck moved onto the main track immediately in front of the train, causing the accident. Had the driver listened and looked in both directions along the track for an approaching train, as required, or had he heeded the warnings provided by the train and crossing signals, the accident would have been averted.

The reason why the truck driver failed to stop short of the crossing for No. 61 could not be determined. There is a possibility that he failed to do so as a result of seeing the rear end of the local freight train occupying the siding east of the crossing and erroneously assuming that this train was causing the crossing warning signals to falsely indicate the approach of another train. This seems to be a remote possibility, however, as the driver should have been able to see and hear No. 61 approaching in sufficient time to stop his vehicle short of the crossing for the train.

Since the driver evidently was not alert while nearing the crossing, there is a much greater possibility that he failed to see or hear No. 61 approaching, and to notice that the automatic crossing-warning signals were indicating the approach of a train, due to fatigue resulting from his prolonged tour of duty the day of the accident and the day before.

Between the time the truck left Abilene the day before the accident and 1:41 a.m. the following day, when plant employees of the Petro-Tex Chemical Corporation at Houston started to reload it for the trip to Tye, the truck moved approximately 679 miles. Assuming it travelled this distance at an average speed of 50 miles per hour, the driver would have accumulated about 13½ hours driving time, or 3½ hours in excess of the maximum driving time permitted under Federal motor carrier safety regulations. The truck was loaded and

reloaded twice while en route to Houston and, according to an official of the motor carrier, these operations would have consumed about 3 hours. If the driver remained in on-duty status during these operations, this time, added to the estimated 13½ hours of driving time, would indicate that the driver had been on duty approximately 16½ hours when he arrived at Houston, or 1½ hours in excess of the maximum on-duty time permitted under Federal motor carrier safety regulations. Assuming that the driver had been on duty 16½ hours and that his vehicle arrived at Houston shortly before 1:41 a. m. the day of the accident, it appears that he first went on duty in Abilene between 8:00 and 9:00 a. m. the day before the accident.

No information could be developed as to when, where or how the driver rested after his arrival at Houston. Since the investigation developed that it was customary for him to do so, the driver probably rested in the sleeping compartment of the tractor cab while his vehicle was at the plant of the Petro-Tex Chemical Corporation. Since all available information indicates that the motortruck arrived at this plant about 1:41 a. m. the day of the accident and that it left the plant at 8:45 a. m. the same day, it appears that the driver could not have rested in the sleeping compartment of the tractor cab for more than six or seven hours. Thus, it further appears that before leaving Houston for Tye, he did not have eight consecutive hours off duty, as required by Federal motor carrier safety regulations when a driver subject to these regulations has had ten hours of driving time or has been on duty 15 hours.

The accident occurred 11 hours 20 minutes after the truck left the Petro-Tex Chemical Corporation plant in Houston. During this time, it moved about 350 miles to the motor carrier's blending plant at Tye, where it was unloaded and reloaded. It then proceeded a short distance to the railroad crossing where the accident occurred. Since the entire trip from Houston to the railroad crossing would have consumed only about 8 hours 45 minutes, computed on the basis of an average speed of 50 miles per hour and 1½ hours for the unloading and reloading operations at the blending plant, there are three hours which cannot be accounted for.

What is known about the driver's tours of duty leading to the accident indicates that in the approximately 36-hour period immediately preceding the accident, he drove a total of approximately 1,039 miles without having had eight consecutive hours off duty for rest, as required. At the time his vehicle neared the railroad crossing, the driver apparently had been on duty about 29 or 30 hours within a 36-hour period and had been driving for an aggregate of about 21 hours within the 36-hour period. Consequently, there seems to be no question that the driver was experiencing considerable fatigue while approaching the crossing. His fatigued condition apparently dulled his alertness to the extent that he did not hear or see the clearly visible train approaching the crossing, heed the warnings being given by the railroad-crossing warning signals, or approach the crossing with the prudence dictated by the nature of the truck.

cargo As a result, he drove onto the crossing immediately in front of the closely approaching train, causing the collision

The Federal Highway Administration has taken appropriate action with respect to the apparent violations of the Federal motor carrier safety regulations, as disclosed in the investigation of this accident

#### Findings

- 1 The train was moving in accordance with applicable operating rules of the railroad carrier
- 2 The automatic railroad-crossing warning signals were functioning properly and were indicating the close approach of a train
- 3 The motortruck failed to reduce speed in approach to the crossing and to stop short of the tracks, as required by Texas State law, and Federal motor carrier safety regulations, causing the collision
- 4 The reason for the truck driver's failure to stop short of the crossing could not be determined However, it appears that he failed to do so because of fatigue resulting from long hours of service prior to the accident

#### Cause

The accident was caused by the failure of truck driver to stop his vehicle short of the crossing and to remain standing until the closely approaching train has passed, as required by Texas State law and Federal motor carrier safety regulations

Dated at Washington, D C , this 12th  
day of November 1968  
By the Federal Railroad Administration,  
Railroad Safety Board.

Bette E Holt  
Acting Executive Secretary

(SEAL)

