

**RAILROAD ACCIDENT INVESTIGATION**

**Ex Parte No 218**

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SEABOARD AIR LINE RAILROAD COMPANY

MELDRIM, GA

JUNE 28, 1959

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**INTERSTATE COMMERCE COMMISSION**

**Washington**

# INTERSTATE COMMERCE COMMISSION

Ex Parte No 218

ACCIDENT NEAR MELDRIM, GA

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Decided August 14, 1959

Accident near Meldrim, Ga , on June 28, 1959, caused by deflection of the rails under the moving train as a result of excessive compression due to longitudinal movement of the rails on the trestle and expansion, this movement being restricted by the securely anchored rails at the end of the trestle. A flash fire resulted from ignition of gas emitted from the ruptured tank of one of the derailed cars.

Richard A. Hollander for the Seaboard Air Line Railroad Company

Crawford L. Pilcher and David O. Benson for the Georgia Public Service Commission

L. E. Chester for the Brotherhood of Railroad Trainmen and The Railway Labor Executives Association

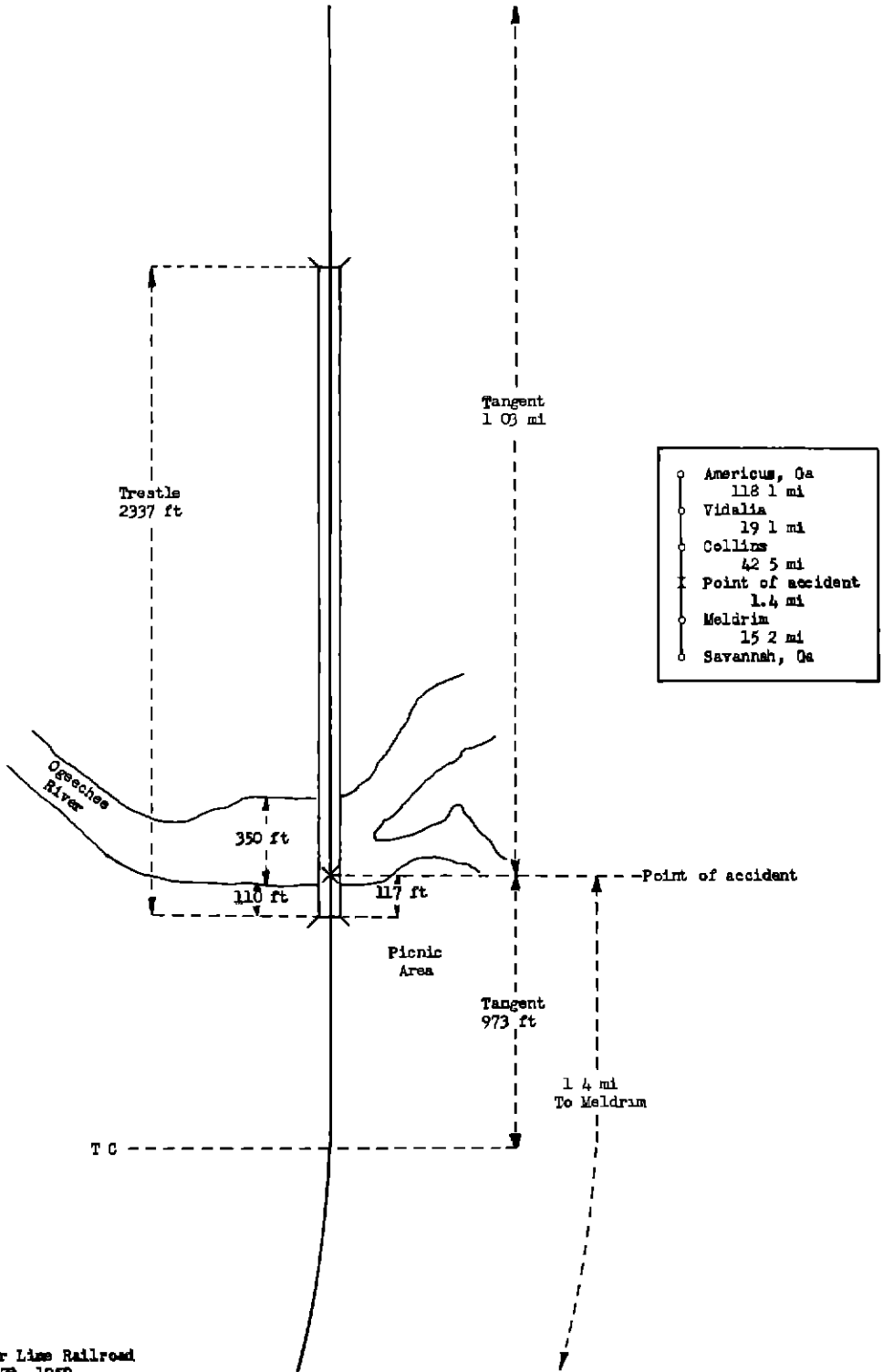
Allyn M. Wallace for Kenneth and Elizabeth Dixon

## REPORT OF THE COMMISSION

DIVISION 3, COMMISSIONERS FREAS, WALRATH, AND McPHERSON

*FREAS, Commissioner*

This is an investigation by the Commission on its own motion with respect to the facts, conditions, and circumstances connected with an accident which occurred on the Seaboard Air Line Railroad near Meldrim, Ga , on June 28, 1959. The accident involved a derailment of a freight train moving over a bridge spanning the Ogeechee River and a flash fire resulting from the ignition of gas emitted from a ruptured tank of one of the derailed cars. This accident resulted in the death of 23 persons and the injury of 1 train-service employee and 6 other persons.



○	Americus, Ga	118.1 mi
○	Vidalia	19.1 mi
○	Collins	42.5 mi
	Point of accident	1.4 mi
○	Meldrim	15.2 mi
○	Savannah, Ga	

Seaboard Air Line Railroad  
 June 28, 1959  
 Meldrim, Ga.

### Location of Accident and Method of Operation

This accident occurred on that part of the Carolina Division extending between Americus and Savannah, Ga., 196.3 miles, a single-track line over which trains are operated by timetable and train orders. There is no block system in use. Near Meldrum, 181.1 miles east of Americus, a bridge 2,337 feet in length spans a slough and the Ogeechee River. The accident occurred on the main track at a point 117 feet west of the east end of this bridge and 1.4 miles west of the station at Meldrum. The track is tangent throughout a distance of 1.03 miles immediately west of the point of accident and 973 feet eastward. The grade is successively, 0.17 percent ascending eastward 1900 feet, 0.07 percent descending 300 feet to the point of accident and 700 feet eastward.

The bridge involved was a ballast-deck trestle with a maximum height of 25 feet above the ground level and contained 188 pile bents. Each bent consisted of either 5 or 6 piles. The outside piles of each bent were batter piles and the other piles were plumb. The batter of the outside piles was 2:12. A cap 12 inches by 14 inches was applied to each bent and was secured to each pile of the bent by a drift bolt. The bents were 12 feet 6 inches apart. The deck consisted of 25 stringers each 6 inches by 12 inches laid side by side to a width of 12 feet 6 inches and these were secured to caps. The outside stringers were raised 6 inches above the other stringers by the addition of a 6-inch by 6-inch filler. The deck was ballasted with stone to a depth of 5 inches. The track was placed on the ballast in the center of the deck. Ballast was then applied in accordance with the carrier's specification for a standard ballast section.

About 350 feet of the trestle spans the Ogeechee River and the other portion of the trestle spans the slough. The east bank of the river is 110 feet west of the east end of the trestle. A picnic area is located on the east bank of the Ogeechee River north of the track.

The track structure in the vicinity of the point of accident consists of 100-pound relay rail, 39 feet in length, laid in this location in 1948 on an average of 24 treated cross ties to the rail length and is provided with 4-hole, 24-inch joint bars. The track structure laid on the trestle is fully tieplated with double-shoulder tie plates, single-spiked and is not provided with rail anchors. It is ballasted with stone to a depth of 5 inches below the bottoms of the ties. Guard rails are not provided. The track structure adjoining the trestle is fully tieplated with single-shoulder tie plates, single-spiked, and is provided with 19 rail anchors per rail throughout a distance of 2,622 feet immediately east of the trestle and throughout a distance of 3,185 feet immediately west of the trestle and the remainder of the track structure is provided with 10 rail anchors per rail. It is ballasted with stone to a depth of 12 inches below the bottoms of the ties. All of the ballast is maintained in accordance with the carrier's specifications for a standard ballast section.

The maximum authorized speed for freight trains in the vicinity of the point of accident is 49 miles per hour.

### Description of Accident

No. 82, an eastbound second-class freight train, consisted of diesel-electric units 1509, 1751, and 1502, coupled in multiple-unit control, 123 cars and a caboose. This train departed from Americus at 7:00 a. m., 4 hours 15 minutes late, stopped at Vidalia, 118.1 miles east of Americus, at 12:05 p. m., where diesel-electric unit 1706 was coupled to the rear end of the locomotive. The train departed from Vidalia at 1:30 p. m., 4 hours 55 minutes late, stopped at Collins, 19.1 miles east of Vidalia, and 42.5 miles west of the point of accident where the 21st car was set out of the train because of an overheated journal. It then proceeded eastward and while moving at an estimated speed of 45 - 49 miles per hour the 107th to the 122nd cars, inclusive, were derailed at a point approximately 117 feet west of the east end of the trestle spanning the Ogeechee River.

Separations occurred at both ends of the 109th to the 121st cars, inclusive. The front portion of the train stopped with the rear end of the 108th car 2,772 feet east of the point of derailment. The 109th to the 119th cars, inclusive, fell from the trestle to the east bank of the river and into the river. The trestle was destroyed throughout a distance of 75 feet eastward from a point 111 feet west of the east end. The 120th car stopped with the front end in the river and the rear end on the trestle. The caboose and the rear two cars stopped on the trestle. The 113th and the 114th cars were tank cars loaded with Liquefied Petroleum Gas and as they fell to the ground the coupler of the 114th car penetrated the tank head of the 113th car. The Liquefied Petroleum Gas was emitted as a gas from the ruptured tank head of the 113th car and blanketed the surrounding area. The gas was ignited from an unknown source which produced a flash fire extending over the surrounding area for a distance of 500 feet east and about 525 feet west of the east end of the trestle and about 400 feet north of the track. A subsequent fire resulted from the flash fire, igniting the derailed equipment, destroying the trestle east of the collapsed portion and damaging 375 feet of the trestle immediately west of the collapsed portion. The tank and the contents of the 114th car were heated by the fire and the lading expanded increasing the pressure in the tank until it was released by the safety valve. The gas emitted from the safety valve was immediately ignited. Ten of the derailed cars were destroyed, 4 were heavily damaged, and 4 were somewhat damaged.

Twenty three persons who were bathing or picnicking in an area adjacent to the trestle were killed or died from injuries received as a result of the fire. The flagman of No. 82 and 6 other persons were injured as a result of the fire.

The weather was clear at the time of the accident, which occurred about 3:40 p. m.

The 113th car of No. 82 was UTLX 97672, a tank car, classification ICC-105A300-W, built in March 1952. The inside diameter of the shell was 85 inches and the cylinder length was 35 feet 3-3/4 inches. The cylinder of the shell consisted of welded sheets 11/16 inches in thickness. Ellipsoidal dished heads 11/16 inches in thickness were secured to the cylinder by welding. The outside surface of the shell was provided with insulation 4 inches thick. The insulation was encased in a steel jacket. The capacity of the tank was 11,000 gallons. The tank was tested at 300 psi when built and the safety valve was adjusted to open at 225 psi on April 18, 1957.

The 114th car of No. 82 was WRNX 11363, a tank car, classification ICC-105A300-W, built in September 1956. The car contained a welded shell which was provided with insulation 4 inches thick. The capacity of the tank was 11,026 gallons. The tank was tested at 300 psi and the safety valve was adjusted to open at 225 psi when the car was built.

### Discussion

As No. 82 was approaching the point where the accident occurred the speed was about 46-49 miles per hour as estimated by the engineer. The engineer and the front brakeman were in the control compartment of the first diesel-electric unit, two student brakemen were in the control compartment of the second diesel-electric unit and the fireman was in the control compartment of the fourth diesel-electric unit. The conductor and the flagman were in the cupola of the caboose. The brakes of this train had been tested and had functioned properly when used en route.

The conductor and the engineer testified that prior to the accident they had made frequent observations of the train en route and with the exception of the car with an overheated journal which was set out of the train at Collins they saw no indication of any defective condition of the equipment. The engineer did not observe any defective track conditions prior to the derailment. The

conductor said that as the rear end of the train approached the east end of the Ogeechee River trestle he saw cars ahead of the caboose derail and fall from the trestle. When the caboose stopped he said that he observed through the windows of the caboose that gas was being emitted from one of the derailed tank cars and was covering the surrounding area and he became concerned. He said that the flagman and he immediately proceeded to the rear platform of the caboose where they observed people in the river along the south side of the trestle. The flagman alighted from the caboose to the trestle and the conductor stood on the rear platform and they shouted warnings to the people in the river and the adjacent area. The conductor said that almost immediately afterward the escaping gas became ignited and the flash fire resulted. The flagman jumped into the river and the conductor returned inside the caboose, closed the windows and doors and remained there until the fire subsided. The members of the crew on the locomotive were unaware of anything being wrong until the brakes of the train became applied in emergency. The forward portion of the train stopped with the locomotive about 550 feet east of the station at Meldrum. The engineer said that he thought a broken air hose had caused the emergency application of the brakes until he observed the smoke resulting from the fire.

Examination of the equipment after the accident disclosed no condition which could have caused or contributed to the cause of the accident. All journals of the derailed cars were inspected and no indications of overheating prior to the accident were found.

An examination of the remaining portion of the track structure in the vicinity of the destroyed portion of the trestle after the accident occurred disclosed that the cross ties had been destroyed by fire. The south rail bore a mark on the gage side of the base of the rail beginning at a point 117 feet west of the east end of the trestle which extended eastward a distance of 40 feet. From this point eastward for a distance of about 2 feet the base of the rail on the gage side had been sheared from its normal width of 5 3/8 inches to a width of 3 7/8 inches. Immediately east of this point, which was 25 feet 6 inches east of the west end of the rail, the south rail was broken. The break was an angular break and indicated that pressure had been exerted against the gage side of the rail causing it to break. The top of the base on the gage side of this rail at the receiving end of the break bore a heavy mark. From the break in the rail eastward for a distance of 18 inches the bottom of the head on the gage side had been cut. At this point a cut mark about 1/2 inch in depth extended diagonally upward on the gage side of the head of the rail. Both the north and south rails bore marks on the gage side of their heads beginning at a point about 214 feet west of the east end of the trestle and extending eastward to the point where the south rail was broken.

Examination of the track west of the point where the derailed equipment stopped on the bridge disclosed that there were no indications of dragging equipment or of any object having been on the track. An inspection of the track structure west of the destroyed portion of the trestle disclosed that flange marks appeared on intermittent ties along the north side of the south rail beginning at a point about 208 feet west of the east end of the trestle and extended eastward to the destroyed portion of the trestle. It is apparent that these marks were made by cars which became derailed after the initial derailment had occurred. The line, gage, and surface of the track, the ties, and the securement of the rails on the undamaged portion of the trestle were maintained in accordance with the carrier's specifications. On the bridge and west of the bridge the north and south rails had moved longitudinally toward the east a maximum distance of about 17 inches. There were indications that the rails were under excessive compression prior to the accident. Rail anchors were removed from the bridge in 1952.

After the accident occurred an examination of the track structure eastward from the east end of the trestle disclosed that flange marks appeared on the ties between the rails, wheel marks were found in the ballast at the south ends of the ties, and a flange mark appeared on intermittent ties on the north side of the north rail. These marks extended eastward from the east end of the trestle to the point where the 107th and the 108th cars stopped and indicated that several trucks were derailed to the south side of the track and that one pair of wheels was derailed to the north side of the track as the 107th and 108th cars passed the east end of the trestle.

The 107th car of No. 82 was SAL 26994, an all-steel box car, built in May 1956. When this car stopped after the derailment occurred the leading wheels of the front truck were derailed to the north side of the track, the rear wheels of the front truck and the rear truck were derailed to the south side of the track. An examination of this car disclosed that the wheels on the south side of the rear truck bore marks on the outside faces of the rims which indicated that the wheels were bearing heavily against the gage side of the head of a rail. At one location the inside of the flange was cut diagonally for a distance of about 6 inches. The opposite wheel at the corresponding location to the cut had 2-½ inch skid marks on the tread. These marks indicated that this pair of wheels had been sliding at some point after the south wheel had derailed. An examination of the wheels of this car disclosed no condition that would allow one wheel of a pair of wheels to drop inside the gage side of a rail while the opposite wheel was in position on the rail.

The 108th car of No. 82 was SAL 14313, a steel underframe box car, built in August 1930. When this car stopped after the derailment occurred both trucks were derailed to the south side of the track.

From the marks found on the rails and other parts of the track structure and on the wheels of the 107th car of this train it is apparent that as No. 82 was moving over the trestle the wheels on the south side of the rear truck of the 107th car dropped inside the south rail in the vicinity of a point approximately 117 feet west of the east end of the trestle and that the pressure of the wheels against the south rail forced the rail outward and it then broke at a point 75 feet west of the east end of the trestle. The wheels on one side of the truck dropping inside the gage side of the rail while the opposite wheels in that truck remained on the opposite rail indicates an out-of-gage condition of the wheel and axle assembly or track structure. As there were no defects on the equipment of No. 82 it is apparent therefore that the rails of the track in the vicinity of the point of the derailment were spread to the extent that wheels of a car dropped from the rail on the gage side while the opposite wheels remained on the rail. This condition apparently developed while No. 82 was moving over the trestle.

On the day of the accident the temperature at Meldrum about 3:00 p. m. was 98 degrees. This temperature was higher than at any time during the previous 11 days. During the examination of the track structure on the trestle west of the point of the derailment it was disclosed that the rails had moved eastward a distance of about 17 inches. With the exception of this longitudinal movement, the inspection of the track structure and of the equipment did not disclose any other condition that would cause the rails of the track to spread. The rails of the track structure laid on the trestle were not provided with rail anchors to prevent longitudinal movement. The rails of the track structure at each end of the trestle were anchored for a considerable distance to prevent or minimize the movement of the rails. However it was noted that the anchors on the rails west of the bridge had moved. It appears, therefore, that the eastward longitudinal movement of the rails west of the bridge and on the bridge, and expansion of the rails as a result of the high temperature caused excessive compression which resulted in an outward deflection of the rails on the bridge as No. 82 moved over it sufficient to permit the south wheels of the rear truck of the 107th car to drop inside the south rail.

The track structure in the vicinity of the point of the accident had been last surfaced on June 12, 1959, at which time the track was raised about  $\frac{1}{2}$  inch. The track was last inspected on June 26, 1959, by the section foreman and on June 23, 1959, by the Division Engineer and no exceptions were taken.

An official of the carrier said that as a matter of policy guard rails are not provided on track structures laid over bridges on this railroad, although no reason was advanced for such policy. However, this practice does not conform with the recommendations of the Engineering Division of the Association of American Railroads, concerning the use of guard rails on track structures laid on bridges. If the track structure on the Ogeechee River trestle had been provided with guard rails, it is probable that the derailed equipment would not have fallen from the trestle.

We find that

- 1 The derailment was caused by deflection of the rails on the trestle under the moving train as a result of excessive compression due to movement of the rails and expansion, this movement being restricted by the securely anchored rails at the east end of the trestle.
- 2 The flash fire resulted from the ignition of gas emitted from the ruptured tank of one of the derailed cars after the car had fallen from the bridge.
- 3 If the track structure on the trestle had been provided with guard rails it is probable that the derailed cars would not have fallen from the trestle.

In view of these findings we recommend that the carrier review its existing policy concerning the use of guard rails on bridges and further explore the recommendations of the Engineering Division of the Association of American Railroads as to their use on such structures.

By the Commission, Division 3

HAROLD D McCOY,

Secretary

(SEAL)