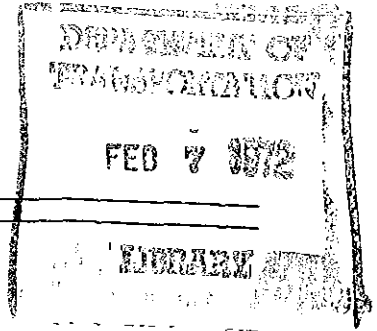


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RAILROAD ACCIDENT INVESTIGATION

REPORT NO. 4157



THE CHESAPEAKE AND OHIO RAILWAY COMPANY

WALKERFORD, VA

NOVEMBER 3, 1969



FEDERAL RAILROAD ADMINISTRATION

BUREAU OF RAILROAD SAFETY

WASHINGTON, D. C. 20591

Summary

DATE:	November 3, 1969	
RAILROAD:	Chesapeake & Ohio	
LOCATION:	Walkerford, Va	
ACCIDENT TYPE:	Side Collision	
TRAINS INVOLVED:	Freight	Freight
TRAIN NUMBERS:	Extra 6057 East	Extra 6056 West
TRAIN CONSISTS:	3 locomotive units, 83 cars, caboose	3 locomotive units, 187 cars, caboose
SPEEDS:	47 m p h	35 m p h
OPERATION:	Signal indications	
TRACK:	Double; tangent; level	
WEATHER:	Clear	
TIME:	8:00 p m	
CASUALTIES:	1 killed; 3 injured	
CAUSE:	Failure of engineer to stop the westbound train short of a stop- signal at the end of double track, apparently due to the engineer fall- ing asleep at the locomo- tive controls	

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
BUREAU OF RAILROAD SAFETY

RAILROAD ACCIDENT INVESTIGATION,
REPORT NO. 4157,

THE CHESAPEAKE AND OHIO RAILWAY COMPANY

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Synopsis

On November 3, 1969, a side collision occurred between two Chesapeake and Ohio Railway freight trains at Walkerford, Va, resulting in death to one and injury to three members of the train crews

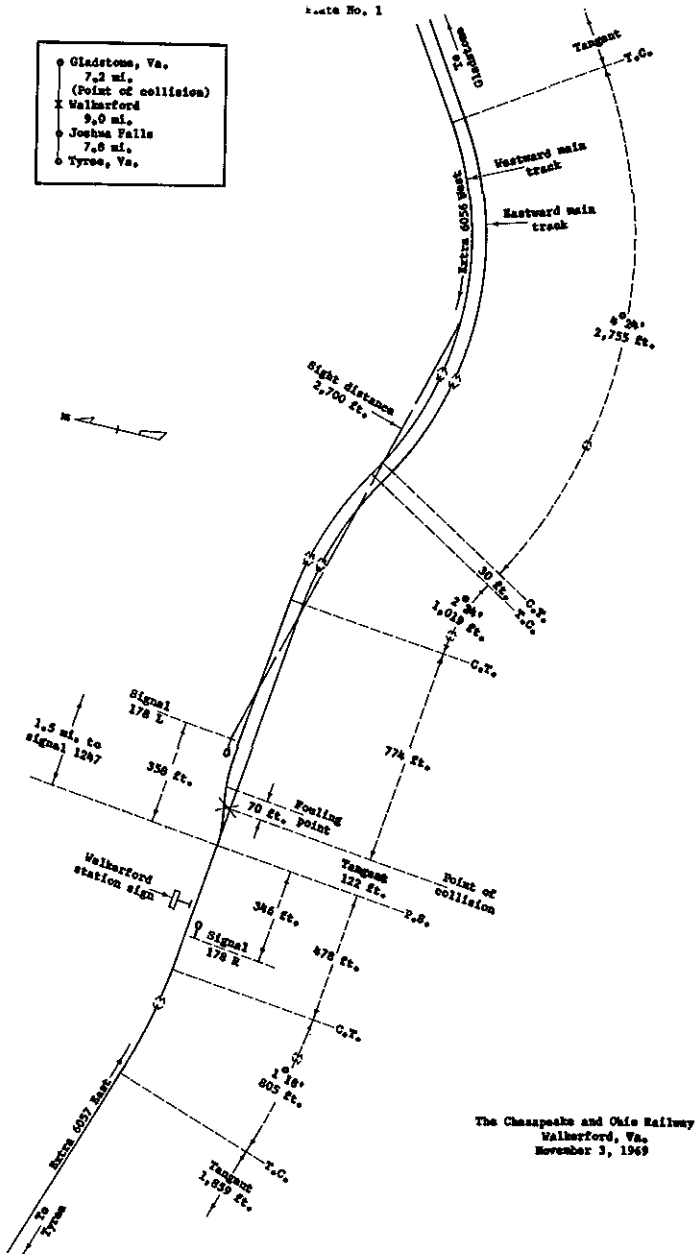
Cause

The accident was caused by failure of the engineer to stop the westbound train short of a stop-signal at the end of double track, apparently due to the engineer falling asleep at the locomotive controls

Location and Method of Operation

The collision occurred on that part of the railroad extending from Tyree to Gladstone, Va, a distance of 24.0 miles. Eastward from Tyree to Walkerford, 16.8 miles, the railroad is a single-track line over which trains operate by signal indications of a traffic control system. Eastward from Walkerford to Gladstone, 7.2 miles, it is a double track line over which trains moving with the current of traffic operate by signal indications of an automatic block-signal system.

At the end of double track at Walkerford, the westward main track converges with the eastward main track via a No. 16 turnout and a power-operated switch at the junction of the single-track and double-track line, as indicated in Plate No. 1



The collision occurred on the double-track line at Walkerford, 122 feet east of the power-operated switch at the end of double track and approximately 70 feet west of the fouling point of the eastward and westward main tracks

Tracks

From the west on the single-track line there are, successively, a tangent 1859 feet long, a 1°18' curve to the left 805 feet, and a tangent 478 feet to the power-operated switch at the end of double-track at Walkerford

From the east on the eastward main track of the double-track line there are, successively, a tangent of considerable length; a compound curve to the right, having a maximum curvature of 4°24', 2755 feet; a tangent 30 feet; a 2°24' curve to the left 1019 feet, and a tangent 774 feet to the collision point and 122 feet westward to the power-operated switch at the end of double track. The westward main track parallels the eastward main track on the north, except where it converges toward the eastward main track via the No 16 turnout at the end of double track

The grade in the Walkerford area is practically level

Signals

Controlled signal 178 R, governing eastbound movements from the single-track line to the eastward main track of the double-track line, is 346 feet west of the power-operated switch at the end of the latter line

Automatic signal 1247 and controlled signal 178 L, governing westbound movements to the single-track line from the westward main track of the double-track line are, respectively, 1.5 miles and 358 feet east of the power-operated switch

The aspects applicable to this investigation, and the corresponding indications and names are as follows:

<u>Signal</u>	<u>Aspect</u>	<u>Indication</u>	<u>Name</u>
178 R	Green-over-Red	Proceed	Clear
178 L	Red-over-Red	Stop	Stop
1247	Yellow	Proceed prepared to stop at next signal Train *** exceeding Medium Speed must take action at or before reaching Approach indication to reduce to that speed	Approach

The controlled signals and the power-operated switch are controlled from the train dispatcher's office. The circuits are so arranged that when the dispatcher has established the route for an eastbound train on the single-track line to proceed on the eastward main track of the double-track line at Walkerford, signals 178 R, 1247 and 178 L display Clear, Approach and Stop aspects, respectively.

Carrier's Operating Rules

Medium Speed - One-half maximum authorized speed, but not exceeding 30 miles per hour

34 All members of engine and train crews must, when practicable, observe and then communicate to each other by its name the indication of each signal affecting the movement of their train *** when the signal becomes clearly visible, and observe the signal again just before passing it

Should the engineer fail to comply with the signal indication displayed, other members of the crew will remind him and, if necessary, take action to insure safety of the train

509. A train *** must stop before any part of *** train *** passes a signal displaying a STOP *** indication ***

Time and Weather

The accident occurred at 8:00 p m , under clear weather conditions

Authorized Speeds

The maximum authorized speed for freight trains in the accident area is 45 m p h. It is restricted to 35 m p h , however, for trains with 160 or more cars

Sight Distance

Because of track curvature and small hills on the north side of the railroad, an engineer on the right side of the control compartment near the front of a westbound road-switcher type diesel-electric unit cannot see signal 178 L before reaching a point about 2700 feet from that signal. As the unit approaches signal 178 L within a distance of 2700 feet and moves on a curve to the left, the short-hood compartment at the front of the unit temporarily obstructs the engineer's view of the signal unless he leans over on his seat to his side window

Circumstances Prior to Accident

Train Dispatcher

About 7:15 p.m , or 45 minutes before the accident, a student train dispatcher, acting under proper supervision,

established the route for Extra 6057 East to proceed eastward from the single-track line to the eastward main track of the double-track line at Walkerford

Extra 6057 East

This train, an eastbound freight train consisting of 3 road-switcher type diesel-electric units, 83 cars and a caboose, passed Joshua Falls, 9 0 miles west of Walkerford, at 7:49 p m . Approximately 11 minutes later, while moving on the single-track line at 47 m p h , as indicated by the speed tape, it neared the west end of the double-track line at Walkerford . The engineer and front brakeman were in the control compartment of the first locomotive unit; the conductor and flagman were in the caboose

Extra 6056 West

On the day of the accident, the crew members of this train had previously operated an eastbound train from Clifton Forge, Va to Gladstone . They had gone on duty at Clifton Forge at 10:30 a m , after having been off duty for 22 hours or more . On arrival at Gladstone, at 5:20 p m , they were called to report for duty at 6:30 p m to operate Extra 6056 West from Gladstone to Clifton Forge . During their short layover period at Gladstone, the engineer, conductor, and front brakeman had dinner together at a restaurant . The flagman remained in the caboose

Extra 6056 West, a westbound freight train consisting of 3 road-switcher type diesel-electric units, 187 cars and a caboose, left Gladstone at 7:31 p m , after having received the prescribed brake test . Approximately 25 minutes later, while moving on the westward main track of the double-track line at 32 or 33 m p h , as indicated by the speed tape, it approached the end of double track at Walkerford . The engineer and front brakeman were in the control compartment near the front of the first locomotive unit; the conductor and flagman were in the caboose

The Accident

Extra 6057 East

As this train moved at 47 m p h on a curve of the single-track line and neared the west end of the double-track line at Walkerford, the engineer saw that signal 178 R displayed a Clear aspect and also saw the headlight of Extra 6056 West on the westward main track of the double-track line . He thought the westbound train was stopped, and turned his headlight off and on in rapid succession as a signal for the engineer of that train to dim his locomotive headlight . The headlight remained bright, however

Apparently within a second or two after the front of Extra 6057 East passed signal 178 R, the locomotive of Extra 6056 West passed signal 178 L and continued on the westward main track toward the power-operated switch at the end of double track, fouling the eastward main track . Possibly due to the glare of the bright headlight facing him, the engi-

neer of Extra 6057 East did not realize the westbound train was moving and obstructing the eastward main track before his train entered that track at the power-operated switch. Immediately thereafter, while Extra 6057 East was moving at 47 m.p.h., the left side of its front end collided with the left side of the front of Extra 6056 West, 122 feet east of the power-operated switch at the end of the double-track line.

Extra 6056 West

As this train moved at 32 or 33 m.p.h. on a curve of the westward main track, signal 1247 came into the front brakeman's view and he saw it displayed an Approach aspect. According to his statements, he called that aspect to the engineer, but could not remember whether the engineer acknowledged or repeated the call. Immediately after calling the aspect of signal 1247, the front brakeman went to the toilet in the short-hood compartment at the front of the first locomotive unit, and remained there until he heard the engineer shout in alarm just before the collision. While in the short-hood compartment, the front brakeman noticed his train was not reducing speed in approach to signals 1247 and 178 L, but felt no concern due to relying on the engineer for the safety of the train.

The engineer stated he heard the front brakeman call the aspect of signal 1247, but understood him to say the signal displayed an Approach-Medium aspect. This signal aspect is somewhat similar to an Approach aspect in that it also authorizes a train to "Proceed Approaching Next Signal At Not Exceeding Medium Speed."

Although signal 1247 evidently displayed an Approach aspect, the engineer recalls having seen it displaying an Approach-Medium aspect when it came into his view shortly after the front brakeman left the control compartment. In any event, he took no action to reduce the speed of his train to one-half its maximum authorized speed of 35 m.p.h., as required by either an Approach or Approach-Medium signal aspect. Instead, the train increased speed to 35 m.p.h., as indicated by the speed tape, while it moved in the block of signal 1247 and neared signal 178 L, which displayed a Stop aspect.

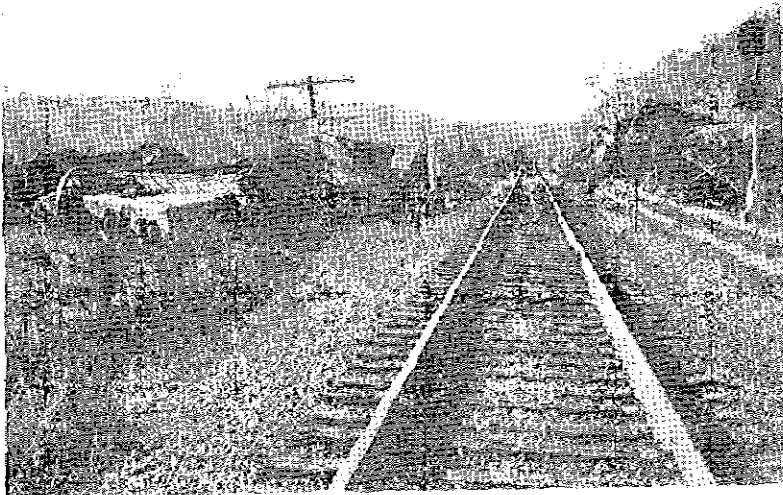
The engineer stated that he took no action to reduce the speed in approach to signal 178 L, due to having "black-ed out" or having fallen asleep just before his train began to pass signal 1247. He further stated that he did not regain consciousness or awaken before the train reached a point about 100 feet from signal 178 L. His statements indicate he then saw signal 178 L displaying a Stop aspect; saw Extra 6057 East approaching a short distance ahead; realized a collision was inevitable; shouted in alarm, and applied his train brakes in emergency. Immediately afterward, before Extra 6056 West was able to reduce speed, its front end passed signal 178 L, passed the fouling point of the eastward and westward main tracks at the end of the double-track line at Walkerford, and collided with the front of Extra 6057 East.

The front brakeman of Extra 6056 West was still in the short-hood compartment when the engineer shouted in alarm just before the collision. He responded to the engineer's shout by going to the doorway of that compartment. The collision occurred at that instant, without the front brakeman having seen signal 178 L or being aware of what was taking place.

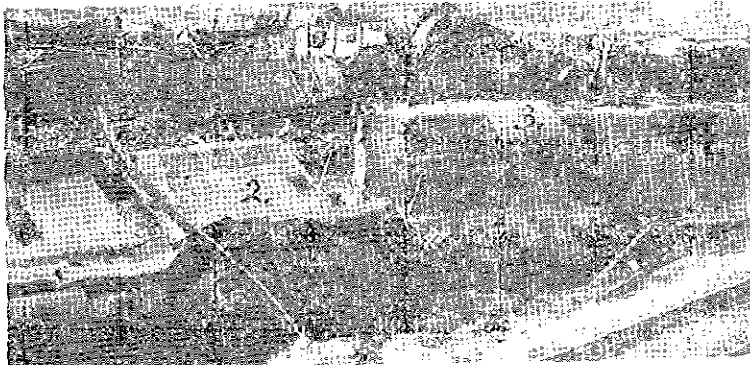
Casualties

The front brakeman of Extra 6057 East was killed. The engineer of that train, and the engineer and front brakeman of Extra 6056 West were injured.

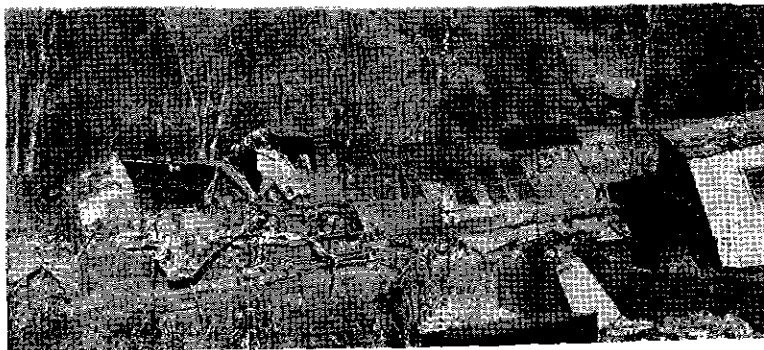
PLATE NO. 2



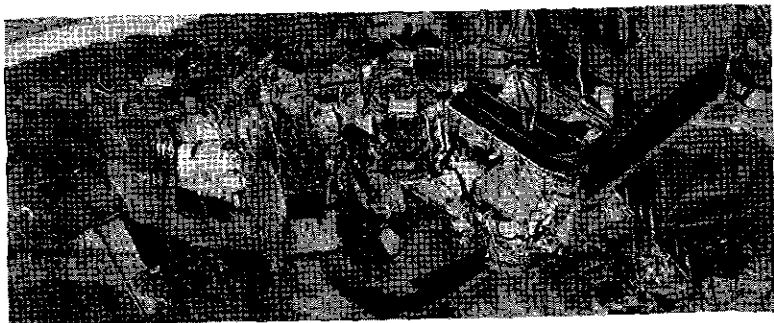
First locomotive of Extra 6057 East at left.



Second and third locomotive units of Extra 6057 East.

PLATE NO. 3

First locomotive unit of Extra 6056 West



Third locomotive unit of Extra 6056 West

DamagesExtra 6057 East

The 3 locomotive units and first 27 cars of this train derailed to the south of the main track structures. The first locomotive unit overturned onto its left side. It stopped with the front end headed in a westerly direction, and with the rear end 238 feet east of the collision point (See Plate No. 2). The second and third units stopped in line alongside the eastward main track and adjacent to the first unit, as shown in Plate No. 2. The derailed cars stopped in various positions on the south side of the track structures.

The first locomotive unit and 22 derailed cars were destroyed. The other 2 units and 5 derailed cars were heavily damaged

Extra 6056 West

The 3 locomotive units and first 19 cars of this train derailed to the north of the track structures. The first locomotive unit overturned and stopped on its right side with the front end 108 feet west of the collision point (See Plate No 3). The second unit also overturned onto its right side. It stopped directly behind, and in line with, the first unit. The third unit (See Plate No 3) stopped upright a short distance to the rear of the second unit. The derailed cars stopped in various positions on the north side of the track structures.

The first and third locomotive units, and 13 of the derailed cars were destroyed. The second unit and the remaining six derailed cars were heavily damaged.

Damage Cost

The estimated cost of damages to track, signal and train equipment was \$774,000.

Train Crews' Hours of Service

Extra 6057 East

Except for the flagman, the crew members of this train had been continuously on duty 5 hours at the time of the accident, after having been off duty over 30 hours. The flagman had been on duty 14 hours 13 minutes in the aggregate, after having been off duty more than eight hours.

Extra 6056 West

At the time of the accident, all the crew members of this train had been continuously on duty 9 hours 30 minutes, after having been off duty over 22 hours. The aforesaid on-duty period includes the time spent by the crew members at Gladstone between tours of duty, as that time period was of insufficient duration to break the continuity of their service.

Post-Accident Tests

The speed-recording devices of both trains were tested and found to be accurate.

Inspections and tests revealed that the portion of the signal system involved in the accident was functioning properly.

Front Brakeman and Engineer of Extra 6056 West

The front brakeman, age 42, had been employed by the carrier as a brakeman since 1951. He had passed a physical examination by the carrier in July 1968, and had attended a rules-instruction class in April 1969. His record was clear.

The engineer, age 58, was first employed by the carrier as a fireman in May 1943 and was promoted to engineer in December 1948. He attended a rules-instruction class in April 1969. In July 1969, he received a physical examination by the carrier and was found to be physically qualified for service. Except for a notation concerning a minor incident in 1957, his record as an engineer was clear.

The engineer considered himself to be in excellent physical condition, and said he had no history of suddenly losing consciousness for any reason. He further said he was fully rested when he first went on duty at Clifton Forge the day of the accident; had not felt sleepy while en route from Gladstone to the collision point, and had taken no medication, narcotic, or alcoholic beverage during the day involved. Other members of the crew said the engineer appeared normal when they conversed with him prior to the accident trip. The investigation revealed nothing which would indicate he was in other than normal condition on departure of Extra 6056 West from Gladstone.

Findings

1. At the time of the accident, Extra 6057 East was moving as authorized by the Clear aspect of signal 178 R and in accordance with applicable rules, except that it was moving at 2 m.p.h. over its maximum authorized speed. The excessive speed was not a significant factor in the accident.
2. Signals 1247 and 178 L displayed Approach and Stop aspects, respectively, for Extra 6056 West.
3. The front brakeman of Extra 6056 West called the Approach aspect of signal 1247 to the engineer, then left the engineer alone in the control compartment while the train continued its approach to both signals 1247 and 178 L, and the end of double track at Walkerford.
4. According to the engineer of Extra 6056 West, he misunderstood the front brakeman's call of the aspect displayed by signal 1247 and thought this signal was displaying an Approach-Medium aspect when it came into his view. However, the engineer's misunderstandings concerning the aspect of signal 1247 were not significant factors in the accident.
5. Extra 6056 West increased speed to 35 m.p.h. in the block of signal 1247, or to 17½ m.p.h. in excess of the maximum speed authorized by the Approach aspect of signal 1247 or the Approach-Medium aspect that the engineer thought the signal displayed.
6. Extra 6056 West then passed signal 178 L, without stopping as required, and fouled the eastward main track at the end of double track immediately in front of Extra 6057 East, causing the accident.

7 According to its engineer, the reason why Extra 6056 West proceeded in the block of signal 1247 at excessive speed and failed to stop at signal 178 L is that he either fell asleep or "blacked out" at the locomotive controls while nearing signal 1247 and did not awaken or regain consciousness until his train was about to pass signal 178 L. Since the investigation revealed nothing to indicate otherwise, the reason given by the engineer for the accident is considered to be bonafide.

8. Considering that the engineer had undergone and passed a physical examination less than three months before the accident, and had no history of suddenly losing consciousness, we conclude that the accident was not due to him having suddenly lapsed into unconsciousness at the locomotive controls because of some physical impairment.

9. Consequently, we conclude the accident was the result of the engineer falling asleep at the controls in approach to signal 1247.

Although the engineer had been on duty only nine hours when Extra 6056 West left Gladstone, it nevertheless appears that he became drowsy while en route to the end of double track at Walkerford due to fatigue from the number of hours he had been on duty and effects of the meal he had consumed at Gladstone a short time before. It further appears that because of his drowsy condition, he misunderstood the front brakeman when the Approach aspect displayed by signal 1247 was called; misinterpreted the aspect displayed by that signal when it came into his view; fell asleep before passing signal 1247, and did not awaken before it was too late to stop his train short of signal 178 L and the collision.

10. A significant contributing factor in the accident was the absence of the front brakeman from the locomotive control compartment during the critical period in which Extra 6056 West neared the end of double track at Walkerford. Had the front brakeman remained in the control compartment, he probably would have seen that the train was not approaching the end of double track in accordance with the indications of signals 1247 and 178 L in sufficient time to take appropriate action to prevent the accident.

This is another case in which the circumstances illustrate the necessity of all crew members assuming and sharing equal responsibility for the safety of their train, for prevention of an accident in the event one of the crew members fails to take proper action under conditions requiring the train to reduce speed or stop.

Dated at Washington, D. C., this 9th
day of September 1970
By the Federal Railroad Administration

Mac E. Rogers, Director
Bureau of Railroad Safety