

INTERSTATE COMMERCE COMMISSION
WASHINGTON

REPORT NO. 3486
SOUTHERN PACIFIC COMPANY
IN RE ACCIDENT
AT ALLARD, CALIF., ON
AUGUST 22, 1952

SUMMARY

Date: August 22, 1952

Railroad: Southern Pacific

Location: Allard, Calif.

Kind of accident: Collision

Equipment involved: Helper locomotive : Freight
and caboose

Train numbers: First 802 : Extra A.T.& S.F.
230 East

Engine numbers: Diesel-electric : Diesel-electric
units 6391, 8132 units 230C,
8133 and 6390, and 230B, 230A, and
helper Diesel- 230L, and
electric unit helper Diesel-
5238 electric units
210C and 210B

Consists: 66 cars, caboose : 68 cars, caboose

Speeds: Undetermined : Standing

Operation: Signal indications

Track: Single; 6°30' curve; 2.07 percent
descending grade westward

Weather: Clear

Time: 2:35 a. m.

Casualties: 3 injured

Cause: Separation from a train of a helper
locomotive and caboose, which then
moved backward out of control on a
descending grade and collided with a
following train, as a result of
failure to apply the independent
brake of the helper locomotive and a
sufficient number of hand brakes on
the rear of the train

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3486

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION REPORTS
UNDER THE ACCIDENT REPORTS ACT OF MAY 6, 1910.

SOUTHERN PACIFIC COMPANY

November 18, 1932

Accident at Allard, Calif., on August 22, 1932, caused by the separation from a train of a helper locomotive and caboose, which then moved backward out of control on a descending grade and collided with a following train, as a result of failure to apply the independent brake of the helper locomotive and a sufficient number of hand brakes on the rear of the train.

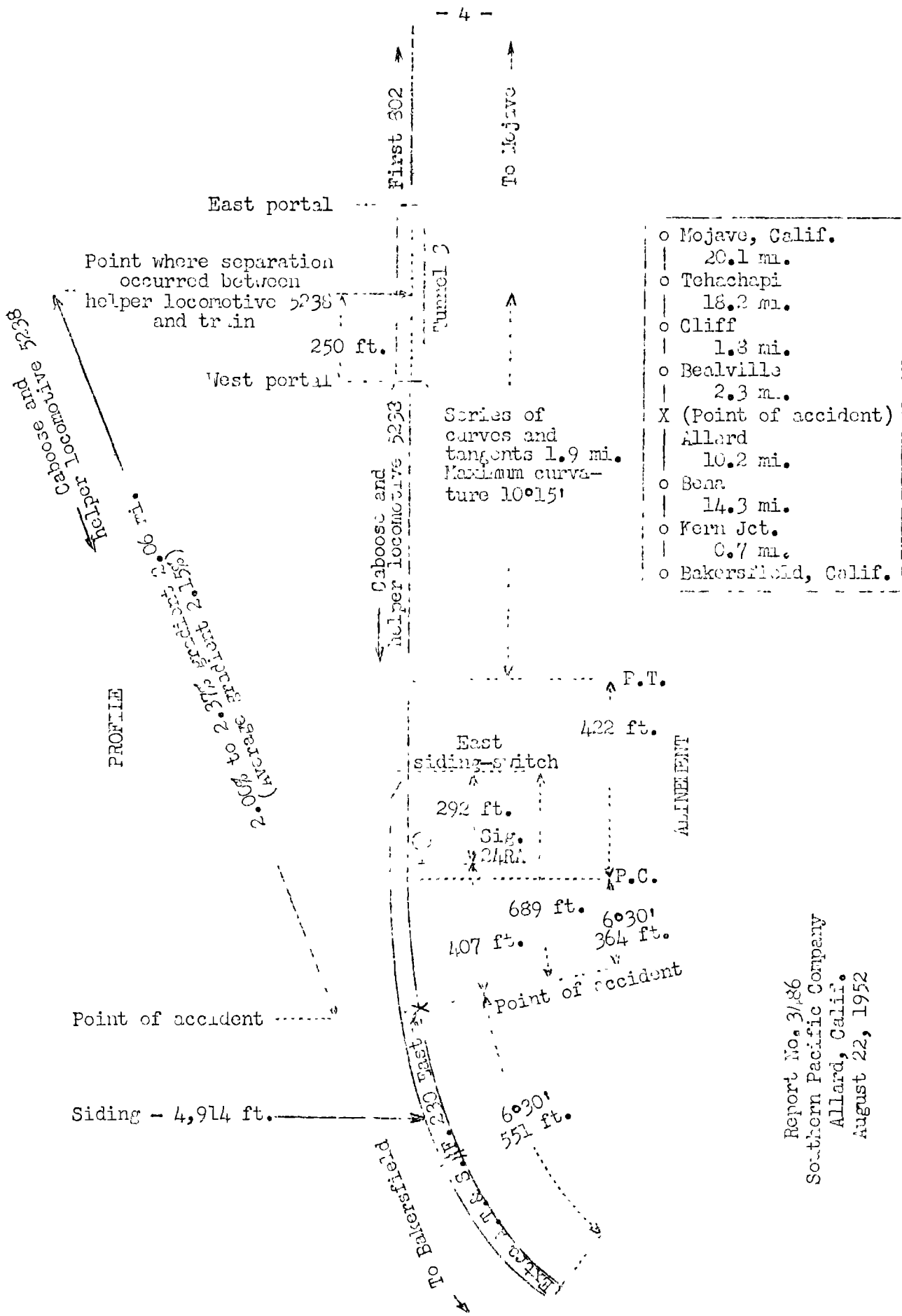
REPORT OF THE COMMISSION¹

PATTERSON, Commissioner:

On August 22, 1932, there was a collision between a helper locomotive and caboose, separated from a train and moving backward out of control on a descending grade, and a following freight train on the line of the Southern Pacific Company at Allard, Calif., which resulted in the injury of three employees. This accident was investigated in conjunction with a representative of the Public Utilities Commission of California.

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Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.



- o Mojave, Calif. 20.1 mi.
- o Tehachapi 18.2 mi.
- o Cliff 1.8 mi.
- o Bealville 2.3 mi.
- X (Point of accident) Allard 10.2 mi.
- o Bena 14.3 mi.
- o Kern Jct. 0.7 mi.
- o Bakersfield, Calif.

Report No. 3186
 Southern Pacific Company
 Allard, Calif.
 August 22, 1952

Location of Accident and Method of Operation

This accident occurred on that part of the San Joaquin Division extending between Bakersfield and Mojave, Calif., 67.6 miles. Trains of the Atchison, Topeka and Santa Fe Railway, hereinafter referred to as the A.T. & S.F., regularly are operated over this portion of the line of the Southern Pacific Company. In the vicinity of the point of accident this is a single-track line, over which trains are operated by signal indications. At Allard, 25.2 miles east of Bakersfield, a siding 4,914 feet in length parallels the main track on the north. The accident occurred on the main track at Allard, at a point 689 feet west of the east siding-switch. From the east there are, in succession, a series of curves, varying between a minimum curvature of $3^{\circ}30'$ and a maximum curvature of $10^{\circ}15'$, and tangents varying from 18 feet to 1,374 feet in length, throughout a distance of 1.9 miles, a tangent 422 feet in length and a $6^{\circ}30'$ curve to the left 564 feet to the point of accident and 551 feet westward. Throughout a distance of 2.06 miles immediately east of the point of accident the grade varies between 2.00 percent and 2.37 percent descending westward and it averages 2.15 percent.

Earthquakes which occurred on July 21, 1952, caused considerable damage to the track and tunnels in the area where the accident occurred. Because of this damage, temporary track had been laid in the vicinity of some of the tunnels to permit construction of permanent track on a new alignment. Tunnel 3, located about 2 miles east of the point of accident, was extensively damaged as a result of the earthquakes. In the construction work, the tunnel was opened for a distance of 206 feet at the east end, and thereby the tunnel was reduced to 494 feet in length.

Semi-automatic signal 24RA, governing east-bound movements on the main track, is located 232 feet west of the east siding-switch at Allard and 407 feet east of the point of accident. This signal is of the color-light type and is approach lighted. It displays three aspects. The aspects applicable to this investigation and the corresponding indications and names are as follows:

<u>Signal</u>	<u>Indication</u>	<u>Name and Aspect</u>
24RA	PROCEED NOT EXCEEDING MEDIUM SPEED, PREPARED TO STOP SHORT OF NEXT HOME SIGNAL	APPROACH SIGNAL YELLOW
		Trains exceeding medium speed must reduce to medium speed before engine reaches the signal in advance view of the signal permits. * * *
	STOP	HOME SIGNAL RED

This signal is part of a traffic-control system extending between Bena and Tehachapi, located, respectively, 10.2 miles west and 22.3 miles east of the point of accident. The control machine is located in the dispatcher's office in Bakersfield. It is equipped with visual indicators to show track occupancy. Approach locking is provided. The controlling circuits are so arranged that when the route is lined for an east-bound movement and the main track between the adjacent eastward controlled point and signal 24RA is occupied by an opposing movement, signal 24RA indicates Stop.

This carrier's operating rules read in part as follows:

811. Employees whose duties connect them with the movement of trains or engines must not absent themselves from their places * * *

Rules governing operation and tests of air and dynamic brakes and air signal apparatus read in part as follows:

2. * * *

* * *

When * * * diesel locomotive is standing, either detached or coupled to a train, the independent brake must be fully applied. * * *

10. * * *

If the train brakes should become applied other than by the engineer * * * If brake pipe has been ruptured, or the train parted, angle cock must be closed on both sides of defect and sufficient hand brakes set to hold train before attempting to make repairs. Hand brakes must not be released until brake pipe pressure has been restored.

32. When stop is made on a grade for an indefinite period, brakes on all locomotives must be fully applied and sufficient hand brakes set, when necessary, to hold the train * * * When on an ascending grade, hand brakes must be set on rear * * * end of train.

* * *

The maximum authorized speed for freight trains in the vicinity of the point of accident is 20 miles per hour, but it was restricted to 15 miles per hour on temporary track.

Description of Accident

First 802, an east-bound freight train, consisted of Diesel-electric units 6391, 8132, 8133 and 6390, coupled in multiple-unit control, 66 cars, helper Diesel-electric unit 5238, headed west and moving in backward motion, and a caboose, in the order named. At Bakersfield, in accordance with timetable special instructions, this train assumed identity as First 802, a third-class train scheduled eastward from Mojave but without schedule between Bakersfield and that point. This train departed from Kern Jct., 0.7 mile east of Bakersfield, at 12:20 a. m., passed Pealville, 27.5 miles east of Bakersfield, about 2 a. m., and was stopped about 2:05 a. m. by an emergency application of the brakes. The train stopped with the front end of the locomotive about 2.64 miles east of the point of accident and the helper locomotive and the caboose near the middle of Tunnel 3. The knuckle of the coupler at the rear end of the fourth car was broken and a separation occurred between the fourth and fifth cars. Several minutes after the train stopped both enginemen alighted from the helper locomotive and proceeded to the east portal of the tunnel. About 25 minutes after the emergency application occurred the broken knuckle was replaced and the train was recoupled. After the brakes of the train were released the slack ran out and the knuckle of the rear coupler of Diesel-electric unit 5238 broke and a separation occurred between the rear car and the helper locomotive. The brakes of the forward portion of the train immediately reapplied in emergency. The helper locomotive and the caboose with no employee on board,

moved westward on the descending grade, passed the flagman, who attempted to board the movement at Bealville, passed the east siding-switch at Allard and while moving at an undetermined speed collided with Extra A.T. & S.F. 230 East.

Extra A.T. & S.F. 230 East, an east-bound A.T. & S.F. freight train, consisted of Diesel-electric units 230C, 230B, 230A and 230L, coupled in multiple-unit control, 49 cars, helper Diesel-electric units 210C and 210B, coupled in multiple-unit control, 19 cars and a caboose, in the order named. This train departed from Kern Jct. at 12:55 a. m., and stopped on the main track at Allard at a point 407 feet west of signal 24RA, which indicated, successively, Approach and Stop. A few seconds later the front end was struck by the caboose and helper locomotive of the preceding train, moving backward and uncontrolled.

The caboose of First 802 and the front truck and the front wheels of the rear truck of helper locomotive 5238 were derailed. The caboose was demolished and obstructed the adjacent siding. The helper locomotive stopped upright and in line with the track. It was considerably damaged. The front truck and the front wheels of the rear truck of the first Diesel-electric unit of Extra A.T. & S.F. 230 East were derailed. The first Diesel-electric unit was badly damaged and the second Diesel-electric unit was somewhat damaged. No other equipment of this train was derailed or damaged.

The engineer, the fireman and the front brakeman of Extra A.T. & S.F. 230 East were injured.

The weather was clear at the time of the accident, which occurred about 2:35 a. m.

Diesel-electric unit 5238 is of the 0-6-6-0 road-switcher type. It is 58 feet long between the pulling faces of the couplers and weighs 323, 310 pounds. This unit is provided with 6-SL and dynamic brake equipment. The air compressor is connected to the crank shaft of the Diesel engine. Main reservoir pressure of 140 pounds is maintained. The unit is provided with KH6P brake valve equipment, which consists of an automatic brake valve portion and an independent brake valve portion. It is equipped with a double-heading cock. When the unit is used in helper service and the brakes of the train are controlled from another locomotive, the double-heading cock is closed and the automatic brake valve and the independent brake valve handles are placed, respectively, in running and release positions. Under these circumstances the brakes of the unit can be operated by the engineer

controlling the brakes of the train, and any condition which depletes brake-pipe pressure of the train at the emergency rate will cause the brakes of the unit to apply in emergency. The brakes of the unit can be released under any and all conditions by depressing the handle of the independent brake valve when it is in release position.

Caboosc 660 was provided with K-1 type brake equipment. It had two 4-wheel trucks and was 35 feet 5 inches long, over the end platform. The estimated weight was 36,850 pounds. With brake cylinder pressure of 60 pounds, braking power was 50 percent of the estimated light weight of the caboosc.

Discussion

The train of First 802 was assembled in the yard at Bakersfield. It consisted of a 4-unit Diesel-electric locomotive, 65 loaded cars, 1 empty car, a helper Diesel-electric locomotive and a caboosc. The helper locomotive was of the road-switcher type. It was headed west and was placed in the train with the rear end of the unit coupled to the sixty-sixth car and the front end of the unit coupled to the caboosc. Members of the crew said that an air-brake test was made by employees of the mechanical force, who took no exception to the condition of the equipment before the train departed at 12:20 a. m.

As First 802 was approaching Tunnel 3, located 0.5 mile east of Bealville, the speed was about 8 miles per hour. The enginemen of the first locomotive were maintaining a lookout ahead from the control compartment at the front of the locomotive and the front brakeman was in the rear unit of the locomotive. The enginemen were in their respective positions in the cab of the helper locomotive. The conductor, the flagman and the swing brakeman were in the caboosc. The engineer said the air gauge indicated that brake-pipe pressure of about 83 pounds was being maintained. In the vicinity of Tunnel 3, the speed was reduced when the wheels of the first locomotive began to slip. About the same time the wheels of the helper locomotive began to slip at frequent intervals. The wheels of both locomotives continued to slip frequently until slack action in the train caused the knuckle of the coupler at the rear end of the fourth car to break. A separation occurred and the brakes of the train became applied in emergency. The forward portion of the train stopped on

temporary track on a 15° curve to the left. The front end of the first locomotive was about 3,030 feet east of the east portal of Tunnel 3 and the helper locomotive and the caboose stopped near the middle of the tunnel. The grade was 2.37 percent ascending where the front end of the train stopped and 2.14 percent ascending where the rear of the train stopped. The engineer of the first locomotive said that when the train stopped he sounded the signal for the flagman to protect the rear of the train and the train-parted signal on the pneumatic horn, and instructed the front brakeman to close the angle cock at the point where the train had parted. When a replacement for the failed knuckle was not found in the units the engineer prepared to remove the knuckle from the front coupler of the locomotive. The conductor said that he had observed after his train left Bakersfield that the caboose gauge indicated the brake pipe was charged to 85 pounds pressure. He said the emergency application of the brakes occurred at 2:05 a. m. Before he alighted from the caboose he observed that the gauge indicated brake-pipe pressure was depleted. The flagman immediately proceeded to the rear to provide protection. The conductor and the swing brakeman alighted from the north and south sides of the caboose, respectively, and proceeded toward the east portal of the tunnel. The conductor said he observed that the enginemen had alighted from the helper locomotive. He said the engineer informed him that they were unable to remain on the locomotive because of gas and exhaust fumes and that they intended to leave the tunnel. He did not reply to the engineer but observed that the enginemen followed him out of the tunnel as he proceeded to the point where the train had parted. Before continuing to the locomotive he prepared the coupler to receive a replacement knuckle. When he arrived at the front end of the locomotive, the engineer and the front brakeman were removing the knuckle from the front coupler. The conductor said that because the replacement of a broken knuckle ordinarily requires only a few minutes he did not instruct the brakeman to apply hand brakes on the separated portions of the train. He said that he informed the engineer of the first locomotive that a truck driver had offered to transport him to Bealville where he could communicate by telephone with the train dispatcher. He had heard a following train and thought that it would avoid delay if he obtained permission from the dispatcher to use the locomotive of that train to assist his train eastward instead of doubling the train to the siding at Cliff, 1.8 miles east of Bealville. The west siding-switch at Cliff was 3,872 feet east of the point where First 802 stalled. Before departing for Bealville in the motor-truck the conductor instructed the swing brakeman to open a highway crossing

about 977 feet west of the point where the first locomotive stopped, to permit the passage of a bus which was waiting to cross the track at that point. The conductor said that it was about 2:30 a. m. when he departed and at that time the train had not been recoupled at the point where the separation had occurred. The swing brakeman and the front brakeman said that several minutes after they recoupled the train the brakes released and then again became applied in emergency. They said that the forward portion of the train did not move before the second emergency application of the brakes occurred. The front brakeman then proceeded toward the locomotive and the swing brakeman opened the crossing for highway traffic. They were unaware of the accident until the conductor returned from Bealville and instructed them to apply hand brakes on the train.

The engineer of helper locomotive 5238 said that the speed of the train was very low when the rear end of the train entered Tunnel 3. The wheels of the locomotive were slipping frequently and he was manipulating the controls to maintain adhesion and to assist the train to the limit of the capacity of his locomotive. He said that the helper locomotive continued to assist the train until the emergency application of the brakes occurred. After the train stopped in the tunnel he observed that the gauge indicated brake-pipe pressure was depleted and that the brakes of the locomotive were applied. He could not recall if he had applied the independent brake. He said that the hand brake was not applied and the independent brake valve was not depressed or fastened in release position. He became concerned about the gas and the exhaust fumes in the tunnel. He said that soon after the train stopped he felt ill and had difficulty in breathing and immediately warned the fireman. The fireman alighted from the locomotive on the north side of the track. When the conductor passed, the engineer informed him that it was impossible to remain on the locomotive. The fireman said that he had kept the window on his side of the cab closed when the train entered the tunnel. He said that after the train stopped he felt some discomfort from the exhaust gases before the engineer instructed him to leave the locomotive. The fireman proceeded to the east portal of the tunnel, following the conductor forward along the north side of the train. About 20 minutes after the engine arrived at the east portal of the tunnel they heard the brakes releasing. The slack ran out with considerable force and they heard a loud noise in the tunnel and immediately entered to investigate. They proceeded to the rear of the train and discovered that a separation had occurred and that the helper locomotive and the caboosa were gone.

The flagman said that he had set the hand brake before he alighted from the caboose. He proceeded westward a distance of about 1,450 feet to the telephone near the east end of the siding at Bealville and communicated with the train dispatcher. He informed him of the delay to his train. He said that he heard the slack run out of the train and soon afterward observed the caboose and the helper locomotive approaching. He thought the reverse movement was for the purpose of picking him up and he gave reduce speed signals and then stop signals as it approached. He attempted to board the caboose and then the locomotive, but because of the speed and the unfavorable footing he was unsuccessful. He said that the Diesel engine was operating at idling speed and he observed no indications of braking action. He estimated that the speed of the movement was about 25 miles per hour. He immediately communicated a warning to the dispatcher.

The dispatcher said that a few seconds previously he had observed that the indicator lights indicated an unauthorized westward movement in the vicinity of Bealville. He said that he immediately had attempted to divert the runaway movement to the siding at Allard as a following train was approaching that point but the time release, which operates in conjunction with approach locking, required an interval of 3 minutes 22 seconds before the east siding-switch could be operated. The collision occurred before that period of time had elapsed.

As Extra A.T. & S.F. 230 East was approaching the point where the accident occurred the speed was about 10 miles per hour, as indicated by the tape of the speed-recording device. The enginemen and the front brakeman were maintaining a lookout ahead from the control compartment at the front of the locomotive. The headlight was lighted. The engineer said that signal 24RA indicated Approach when it first came into view and the indication was called by the members of the crew on the locomotive. He said that a few seconds later he observed the indication of the signal change from Approach to Stop. He immediately made a 10-pound service reduction with the automatic brake valve. He said that his train stopped a few seconds before the accident occurred. The fireman said that he called a warning when he saw the runaway movement approaching.

Examination of helper locomotive 5238 after the accident occurred disclosed that the knuckles of the couplers of the unit were broken. The Diesel engine had been shifted on its base a distance of 11-1/2 inches by the force of the impact. Fuel and oil lines were broken. The throttle was in closed position and the reverser was in neutral position. The double heading cock was closed. The automatic brake valve was in

running position and the independent brake valve was in release position. The caboose was demolished and the condition of its brake equipment could not be determined. There was no discoloration or other indications of heavy braking action on the wheels of either the locomotive or the caboose.

The rules of this carrier require that employees remain at their places of duty. When the brakes of a train become applied, other than by the action of the engineer, sufficient hand brakes must be set to hold the train before attempting to make repairs. Hand brakes must not be released until brake-pipe pressure has been restored. When a train stops on a grade the brakes on all locomotives must be fully applied. The investigation disclosed that it had been the practice, in some cases when an emergency application of the brakes occurred as a result of a separation in the train, to make repairs without first setting sufficient hand brakes to hold the train, and to depend on the independent brakes of the locomotives in the train to hold it until the repairs were completed. In the instant case because of extreme discomfort and possible danger caused by the gas and exhaust fumes in the tunnel, the enginemen hurriedly left the helper locomotive without applying either the independent brake or the hand brake. Other hand brakes, sufficient to hold the train until repairs were completed and the brake pipe recharged, were not set.

After the accident occurred and after repairs and adjustments of the damaged parts of the air-brake system were made, the brakes of Diesel-electric unit 5238 were tested at the scene of the accident. The brake system of the unit was charged with air supplied by another locomotive. The brakes of Diesel-electric unit 5238 functioned properly during these tests. Later the distributing valve was removed from this locomotive and tested on a test rack in accordance with the standard code of tests. It met all requirements of the carrier. The distributing valve and the independent brake valve were dismantled and examined and no defective condition was found.

Before the train departed from Bakersfield the brakes functioned properly when tested. According to statements introduced at the investigation, the brake pipe was charged to 85 pounds pressure. A separation in the train occurred when the knuckle at the rear of the fourth car broke as the first locomotive entered the temporary track east of Tunnel 3, and the brakes applied in emergency. Examination of the failed knuckle disclosed that a flaw, which could not have been detected by visual inspection, extended over approximately 50 percent of the area at the point of fracture. The remainder of the break was new. The engineer said that the

brakes of the helper locomotive applied when the train stopped with the rear end in Tunnel 3. At the same time, the caboose gauge indicated complete depletion of brake-pipe pressure. Under these circumstances, the brake-cylinder pressure of the helper locomotive should have equalized with the combined pressures in the pressure chamber and the application cylinder of the distributing valve at about 47 pounds. The brakes of the locomotive would then remain applied as long as the pressure of this volume was sufficient to actuate the application piston and main reservoir pressure was maintained. The brakes of the caboose should have applied at the point of equalization of pressure in the auxiliary reservoir and brake cylinder at about 65 pound pressure. An interval of not less than 25 minutes elapsed before the train was recoupled at the point where the first separation occurred. As the helper locomotive had assisted to the point where the train stalled, the slack at the rear of the train was closed. When brake-pipe pressure was restored sufficiently to release the brakes, the resultant run-out of slack was unusually violent. The knuckle of the coupler at the east end of the helper locomotive broke and the helper locomotive and the caboose then separated from the train and moved westward on the descending grade. Examination of the failed knuckle at the east end of locomotive 5238 disclosed that the fracture was a new break. Apparently during the period that the brakes at the rear of the train remained applied in emergency there was an appreciable reduction in the pressure of the volume of air which had equalized between the pressure chamber and the application cylinder of the distributing valve of the helper locomotive, and pressure in the brake equipment of the caboose was also depleted. The restoration of brake pipe pressure effected a release of the brakes. It is probable that the brakes of the helper locomotive were first then to release. Apparently, the violent slack action occurred before the pressure chamber of the distributing valve of the helper locomotive and the brake equipment of the caboose were recharged sufficiently to cause an effective reapplication of the brakes when the separation occurred. If the independent brake of the helper locomotive had been applied, or if sufficient hand brakes to hold the train had been applied, until repairs were completed and the brake pipe fully recharged, severe slack action would have been avoided and this accident would not have occurred.

Cause

It is found that this accident was caused by the separation from a train of a helper locomotive and caboose, which then moved backward out of control on a descending grade and collided with a following train, as a result of failure to apply the independent brake of the helper locomotive and a sufficient number of hand brakes on the rear of the train.

Dated at Washington, D. C., this eighteenth day of November, 1952.

By the Commission, Commissioner Patterson.

(SEAL)

GEORGE W. LAIRD,
Acting Secretary.