INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT NO. 3442

UNION PACIFIC RAILROAD COMPANY

IN RE ACCIDENT

AT ORCHARD, IDAHO, ON

NOVEMBER 25, 1951

SUMMARY

Date:	November 25, 1951	
Railroad:	Union Pacific	
Location:	Orchard, Idaho	
Kind of accident:	Head-end collision	
Trains involved:	Freight	: Freight
Train numbers:	Extra 1553 West	: Second 262
Engine numbers:	Diesel-electric units 1553A and 1558C	: Diesel-electric units 1504A, 1530B, 1516B and 1522C
Consists:	67 cars, caboose	: 116 cars, caboose
Estimated speeds:	50 m. p. h.	: Standing
Operation:	Timetable, train orders and automatic block-signal system; yard limits	
Track:	Single; tangent; level	
Weather:	Clear; dark	
Time:	6:45 a. m.	
Casualties:	5 killed	
Cause:	Failure to operate the west-bound train in accordance with yard-limit restrictions and signal indications	

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3442

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

UNION PACIFIC RAILROAD COMPANY

February 5, 1952

Accident at Orchard, Idaho, on November 25, 1951, caused by failure to operate the west-bound train in accordance with yard-limit restrictions and signal indications.

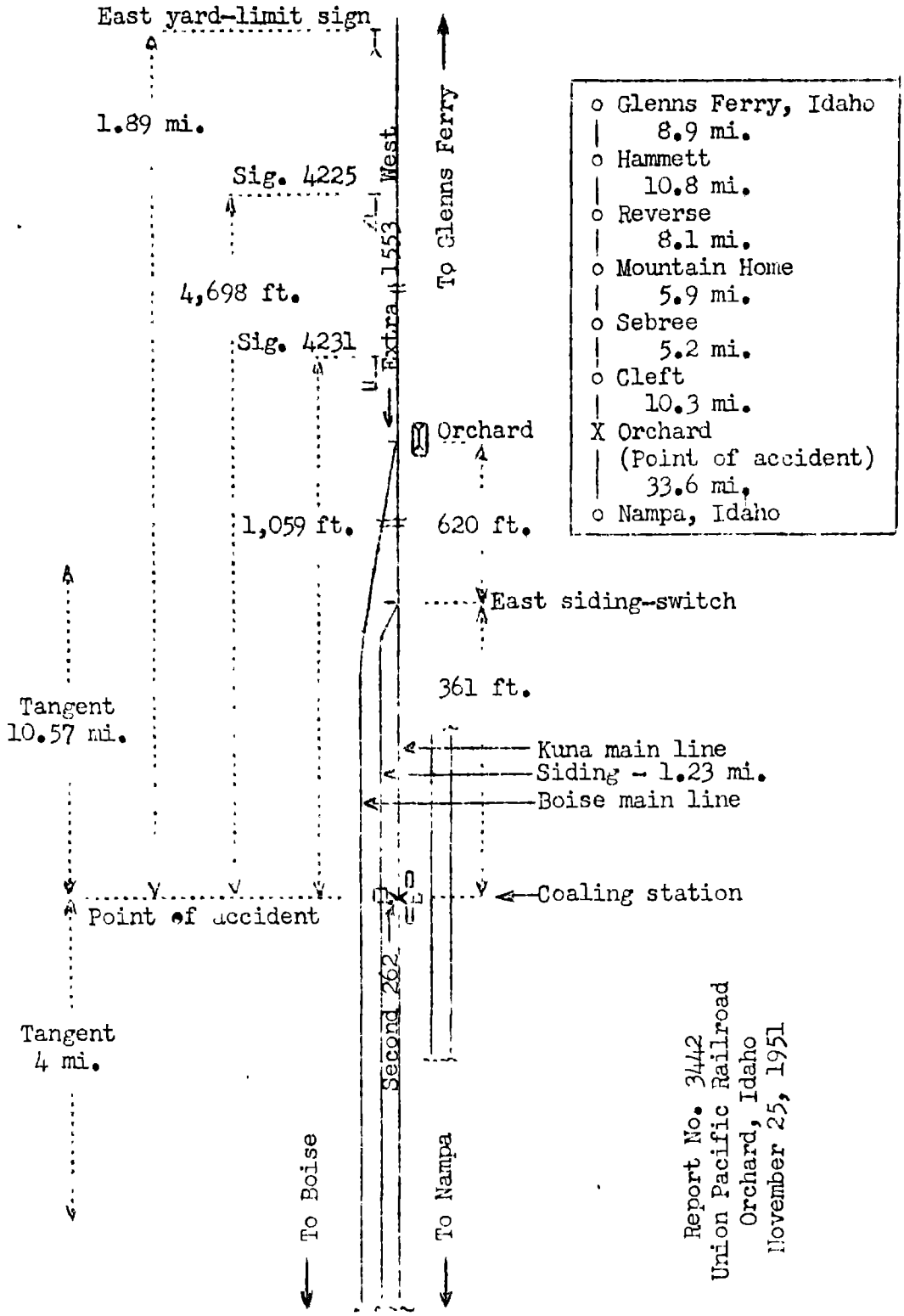
REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On November 25, 1951, there was a head-end collision between two freight trains on the Union Pacific Railroad at Orchard, Idaho, which resulted in the death of five employees. This accident was investigated in conjunction with representatives of the Idaho Public Utilities Commission.

---

[1] 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.



Report No. 3442
Union Pacific Railroad
Orchard, Idaho
November 25, 1951

Location of Accident and Method of Operation

This accident occurred on that part of the Idaho Division extending between Glenns Ferry and Nampa, Idaho, via the Kuna line, 82.8 miles. In the vicinity of the point of accident this is a single-track line over which trains are operated by timetable, train orders and an automatic block-signal system. At Orchard, 49.2 miles west of Glenns Ferry, a siding 1.23 miles in length parallels the main track of the Kuna line on the north, and a line to Nampa, via Boise, diverges northward. The east switch of the siding is 620 feet west of the station. The switch of the diverging line is power-operated and it is located in the immediate vicinity of the station, from which it is controlled. The accident occurred on the main track within yard limits 361 feet west of the east siding switch and 1.89 miles west of the east yard limit sign. The track is tangent throughout a distance of 10.77 miles east of the point of accident and about 4 miles westward. The grade for west-bound trains varies between level and 0.30 percent descending throughout a considerable distance east of the point of accident and at that point it is level.

Automatic signal 4225 and semi-automatic signal 4231, governing west-bound movements on the main track, are located, respectively, 4,698 feet and 1,059 feet east of the point of accident. These signals are of the two-arm lower-quadrant semaphore type and are approach lighted. Each signal displays three aspects. The aspects applicable to this investigation and the corresponding indications and names are as follows:

Signal	Day Aspect	Night Aspect	Indication	Name
4225	Diagonal over horizontal	Green over yellow	Immediately reduce speed to 20 miles per hour, and as much slower as necessary in order to be able to stop before passing the next signal.	Approach signal.
4231	Horizontal over horizontal	Red over red	Stop.	Stop signal.

Signal 4231 and the power-operated switch of the diverging line are controlled from an interlocking machine located in the station at Orchard. Visual indicators to indicate track occupancy are provided. The controlling circuits are so arranged that when the block on the Kuna line between signal 4231 and the next westward signal is occupied and the power-operated switch is lined for movement to that route, signal 4235 indicates Approach and signal 4231 indicates Stop.

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

DEFINTIONS

Restricted Speed.--Proceed prepared to stop short of train, obstruction, or switch not properly lined, and be on lookout for broken rail, or anything that may affect movement of train.

ENGINE WHISTLE SIGNALS

14.

Note.--The whistle must be sounded where required by rule or law. * * *

The signals prescribed are illustrated by "o" for short sounds; "__" for longer sounds. * * *

* * *

Sound	Indication
* * *	
(g) o o	Answer to any signal requiring an answer, except as otherwise provided.
* * *	
(l) __ __ o __	Approaching public crossings at grade * * *
(m) _____	Approaching stations, junctions * * *

* * *

17 (B). Headlights on road engines must be dimmed * * *

* * *

While standing on main track awaiting arrival of an approaching train that is to take siding, but not until approaching train dims its headlight * * *

* * *

29. When a signal except a fixed signal, is given to stop a train, it must be acknowledged as prescribed by Rules 14 (g) * * *

73. Extra trains are inferior to regular trains.

S-89. At meeting points, the inferior train must take the siding * * *

* * *

93. Within yard limits the main track may be used, protecting against first-class trains.

* * *

All trains and engines must move within yard limits prepared to stop unless the track is seen or known to be clear. * * *

Note.--Limits of yards are indicated by yard limit signs and the location of yards is shown in time-table.

98. Trains and engines must approach * * * junctions * * * prepared to stop unless the switches are properly lined, signals indicate proceed and track is clear. * * *

FORMS OF TRAIN ORDERS

* * *

S-C.

Giving Right Over Another Train

* * *

(2) Extra 38 East has right over No 3 F to A

* * *

When a train is given right over another train between two stations, if the trains meet at either of the designated stations, the first-named train must take the siding, unless the train order otherwise prescribes.

* * *

605. Interlocking signals govern use of routes of interlocking. For movements within home signal limits, their indications supersede superiority of trains, but do not dispense with use or observance of other signals whenever and wherever they may be required.

* * *

Special rules read in part as follows:

17 (R). The following will govern use of oscillating red headlight:

* * *

* * * When occupying main track in meeting an opposing train, except in CTC territory, red headlight will be displayed until opposing train dims its headlight in accordance with Operating Rule 17 (B), after which, if switch is lined to permit opposing train to enter siding, red headlight will be extinguished.

* * *

733 (R). There is hazard of carbon monoxide fumes from exhaust of Diesel * * * engines and precautions must be taken to avoid possibility of accident therefrom.

* * *

The maximum authorized speed for freight trains was 50 miles per hour, but it was restricted to 25 miles per hour in the immediate vicinity of the point where the accident occurred.

Description of Accident

Extra 1553 West, a west-bound freight train, consisted of Diesel-electric units 1553A and 1558C, coupled in multiple-unit control, 67 cars and a caboose. At Reverse, 29.5 miles east of Orchard, the crew received copies of train order No. 208 reading in part as follows:

> First 262 wait at
> Orchard until Four forty 440 a m
> for Extra 1553 West
> Extra 1553 West has right over
> Second 262 Reverse to Orchard

This train departed from Mountain Home, the last open office, 21.4 miles east of Orchard, at 4:25 a. m., and entered the siding at Sebree, 15.5 miles east of Orchard, where it met First 262 and No. 106, an east-bound first-class passenger train, and where it was passed by No. 25, a west-bound first-class mail-and-express train. Extra 1553 West then departed from the siding at Sebree, passed the east yard-limit sign at Orchard, passed signal 4225, which indicated Approach, passed signal 4231, which indicated Stop, passed the east siding-switch, where it was required to enter the siding to meet Second 262, and while moving at an estimated speed of 50 miles per hour it collided with Second 262.

Second 262, an east-bound second-class freight train, consisted of Diesel-electric units 1504A, 1530B, 1516B and 1522C, coupled in multiple-unit control, 116 cars and a caboose. At Nampa, the last open office, 33.6 miles west of Orchard, the crew received copies of train order No. 208. This train departed from Nampa at 5 a. m., 8 hours 40 minutes late, and stopped on the main track within yard limits at Orchard about 6:10 a. m. About 35 minutes later it was struck by Extra 1553 West.

The Diesel-electric units and the first 43 cars of Extra 1553 West were derailed and stopped with the Diesel-electric units and the cars in various positions on or near the main track and the siding. Both Diesel-electric units and the first 39 cars were destroyed. The fortieth car was considerably damaged and the forty-first and forty-second cars were somewhat damaged. The first three Diesel-electric units and

the front truck of the fourth unit of Second 262 were derailed. The front end of the first unit was forced upward and separated from the frame. The rear units remained upright and no other equipment of this train was derailed. The first Diesel-electric unit was destroyed and the other units were badly damaged. Escaping fuel oil became ignited and these units were further damaged by fire. A coaling station adjacent to the track was struck by the derailed equipment and was destroyed.

The engineer, the fireman and the front brakeman of Extra 1553 West and the engineer and the fireman of Second 262 were killed.

The weather was clear and it was dark at the time of the accident, which occurred about 6:45 a. m.

The Diesel-electric units of Extra 1553 West were equipped with 24-RL and dynamic brake equipment. The first Diesel-electric unit of Extra 1553 West was equipped with a safety-control feature actuated by a diaphragm foot-valve pedal. If pressure on this pedal is released a service application of the brakes will result unless a brake application of predetermined brake-cylinder pressure has been made, and power to the traction motors of the Diesel-electric units will be cut off. An emergency valve was located in the control compartment of the first unit, Diesel-electric unit 1553A was equipped with an oscillating red headlight so arranged that it would be displayed and the conventional headlight would be extinguished by an emergency application of the air brakes.

Discussion

When Extra 1553 West departed from Glenns Ferry at 2:30 a. m., the engineer, the fireman and the front brakeman were on the locomotive. The conductor and the flagman were in the caboose. The brakes of this train had been tested and had functioned properly when used en route. Stops were made at Hammett, Reverse, Mountain Home and Sebree, located, respectively, 8.9 miles, 19.7 miles, 27.8 miles and 33.7 miles west of Glenns Ferry. Two helper engines were added to the train at Hammett, and they assisted it westward to Reverse, where they were detached. Extra 1553 West entered the siding at Mountain Home and at Sebree. At each of these points the speed of the train was properly controlled and the stop was made at the usual location. Extra

1553 West remained on the siding at Sebree about 1 hour 25 minutes, where it met First 262 and No. 106, an east-bound first-class passenger train, and was passed by No. 25, a west-bound first-class mail-and-express train. About 15 minutes after the train entered the siding, the conductor inspected the train and entered the control compartment of the locomotive. He said that the members of the crew on the locomotive were engaged in a general conversation and they appeared alert and normal. He said that there was a discussion concerning Second 262, and that all understood that Extra 1553 West was required to take the siding at Orchard for that train. The conductor remained on the locomotive until No. 25 had passed and then lined the siding-switch, while the front brakeman lined the derail for the movement of their train to the main track. When Extra 1553 West departed from the siding the conductor boarded the caboose. The train proceeded at low speed on an ascending grade until it had passed Cleft, 10.3 miles east of Orchard, and then the speed was increased to about 50 miles per hour. The conductor and the flagman were in the cupola of the caboose as the train entered the tangent on which the accident occurred. A high car immediately ahead of the caboose obstructed their view from the cupola. The red aspects of the signals at Orchard were visible briefly to the conductor, seated on the left side of the cupola, before the caboose reached the tangent and his view again was obstructed by the high car. The flagman said that from the right side of the cupola he observed that each wayside signal displayed its most restrictive aspect when the caboose passed it. Both members of the crew in the caboose said that a service application of the brakes was made when the train was about 1 mile east of the yard-limit sign and the speed was reduced to about 30 miles per hour.

Second 262 stopped on the main track at Orchard about 6:10 a. m., with the front end of the locomotive 361 feet west of the east siding-switch and under the elevated structure of a coaling station which spanned the main track and the siding at that point. The engineer and the fireman were in the control compartment at the front of the locomotive. The front brakeman was inspecting the forward portion of the train and the conductor and the flagman were inspecting the rear portion. The reflection of the headlight of Extra 1553 West became visible about the time that the front brakeman and the flagman met near the middle of the train. The flagman returned to the rear of the train and the front brakeman returned to the front end and entered the control compartment

of the locomotive on the engineer's side. The front brakeman said that the engineer and the fireman appeared alert and normal. The fireman called his attention to the approaching train and suggested that he line the east siding-switch for its movement. The front brakeman said that he alighted from the locomotive and ran toward the switch. When he was about 120 feet east of the locomotive, he realized that the speed of the approaching train was not being reduced and that he would not have time to line the switch for the approaching train to enter the siding. He said that he gave stop signals with his lantern but they were not answered and that the headlight of Extra 1553 West was brightly lighted when he last observed it a few seconds before the collision occurred.

The operator at Orchard said that after No. 25 departed from that station at 6:21 a. m., he lined the route for the movement of Extra 1553 West to the Kuna line. Because he could not clear signal 4231, the operator obtained a white light and a yellow light and waited on the track in the vicinity of the signal to give the required hand signal to authorize Extra 1553 West to proceed to the siding after it had stopped at signal 4231. The operator observed that signal 4231 indicated Stop and that the headlight of Second 262 was dimmed. He said that he had left his office at 6:42 a. m., and at that time Extra 1553 West was about 2 miles east of the station. When the approaching train was about 1,300 feet distant the operator became concerned and gave reduce-speed signals with the yellow and the white lights. When his signals were not answered and the speed of the train was not reduced he gave stop signals. He attempted to warn the crew of Second 262 but the yellow light became extinguished and he continued to give Stop signals to Extra 1553 West with the white light. When the train was closely approaching signal 4231 he left the track and ran to a step at the entrance of the station. He looked into the operating compartment as the locomotive passed the station but saw no member of the crew and the windows and the door on the south side of the control compartment were closed. He shouted a warning but there was no response from the members of the crew on the locomotive and the speed was not decreased before the accident occurred. He heard the sound of Diesel motors of Extra 1553 West from the time he left his office and there was no change in the sound of the exhaust to indicate that the motors were shut off before the collision occurred. He did not hear the whistle sounded while the train was approaching the point where the accident occurred. Whistle posts for rail-highway grade crossings are located, respectively, 2,669 feet and 934 feet east of the station.

Tests of the signal apparatus in the vicinity of Orchard were begun by the signal forces of the carrier about 3 hours after the accident occurred. In these tests the signal system functioned properly. The engineer of No. 25, which passed Extra 1553 West at Sebree and arrived at Orchard about 25 minutes before the accident occurred, said that the signals between those points were clearly visible when his train passed.

Examination of the control compartment of the first Diesel-electric unit of Extra 1553 West disclosed that the controlling apparatus was badly damaged as a result of the collision and fire. The automatic and independent brake valves were found in running position. The position of the throttle could not be determined and the tape of the speed recording device was destroyed.

The members of the crew on the locomotive of Extra 1553 West were alert and normal when their train departed from Sebree. The investigation indicated that there was no appreciable reduction in the speed of the train, and power was being used up to the time of the collision. When this locomotive passed the station at Orchard no one in the operating compartment was visible from the entrance to the station although from the same location the operator ordinarily could see the members of the crews on passing locomotives. There was no response to the flagging signals or to the warning shouted by the operator as the locomotive passed him. The engineer, the fireman and the front brakeman were killed in the accident and it could not be determined why no action was taken to stop the train. From the extent of the damage which resulted from this accident it is apparent that Extra 1553 West was running at high speed when the accident occurred.

There is no record of the weather conditions prevailing between Sebree and Orchard immediately before the accident occurred. A weather station at Mountain Home, approximately 15 miles southeast of Orchard, recorded a wind velocity of 15 to 18 miles per hour from the southeast at 7 a. m., on the day of the accident. The weather station at Gowen Field, located about 3.5 miles south of Boise and about 30 miles west of the point of accident, reported a wind velocity of 16 miles per hour from the east at 7:13 a. m., on that day. During the time that Extra 1553 West was moving on the ascending grade between Sebree and Cleft, 5.2 miles, the speed of the train was probably about equal to the wind velocity as recorded at the weather stations at Mountain Home and Gowen Field. Under this condition, the exhaust gases from the Diesel

engines would move along with the train, and air taken from the outside into the control compartment would contain these gases. Included in the exhaust gases of Diesel engines is carbon monoxide, which is both colorless and odorless and toxic in effect when inhaled. On exposure to high concentrations of this gas, a person may be rendered unconscious without preliminary symptoms. After the accident occurred, it could not be determined whether this gas was present in the control compartment of Diesel-electric unit 1553, and an autopsy was not performed to determine whether the employees on the Diesel-electric unit had been affected by this gas. The Commission investigated an accident on this line which occurred at Coolidge, Idaho, on January 30, 1949, Report No. 3231. This accident was a head-end collision between two freight trains and resulted in the death of three employees. The east-bound train was hauled by a Diesel-electric locomotive consisting of four units. All employees on the locomotive were killed. The manner in which these two accidents occurred was almost identical. In each instance a train passed approach and stop signals and the point where it was required to meet an opposing train, and struck the opposing train while the engine was under load and without a brake application being made. In each instance the employees on the locomotive were not visible to other employees who observed the locomotive passing them immediately before the accident occurred and from a location where the employees on the locomotive normally could be seen. Although it was not established that toxic gases were present in the cabs of the locomotives involved in these accidents, serious consideration should be given to improved ventilation and a means of detection of toxic gases in the control compartment of Diesel-electric units in sufficient concentration to impair the faculties of the employees operating the locomotive.

Cause

It is found that this accident was caused by failure to operate the west-bound train in accordance with yard-limit restrictions and signal indications.

Dated at Washington, D. C., this fifth day of February, 1952.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,

Secretary.