

INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 2925

THE ATCHISON, TOPEKA AND SANTA FE
RAILWAY COMPANY

REPORT IN RE ACCIDENT

AT FRANCONIA, ARIZ., ON

AUGUST 21, 1945

SUMMARY

Railroad: Atchison, Topeka and Santa Fe
Date: August 21, 1945.
Location: Franconia, Ariz.
Kind of accident: Side collision
Trains involved: Passenger : Passenger
Train numbers: Second 23 : Third 23
Engine numbers: 1863 : 3719
Consist: 17 cars : 9 cars
Estimated speed: 3 m. p. h. : 40 m. p. h.
Operation: Signal indications
Track: Double; tangent; 1.0 percent
descending grade westward
Weather: Clear
Time: 1:46 p. m.
Casualties: 7 injured
Cause: Train fouling main track immedi-
ately in front of following train
Recommendation: That the Atchison, Topeka and Santa Fe
Railway Company provide adequate pro-
tection for movements from sidings to
main track

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2925

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

THE ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

October 10, 1945.

Accident at Franconia, Ariz., on August 21, 1945, caused
by a train fouling the main track immediately in
front of a following train.

REPORT OF THE COMMISSION¹

PATTERSON, Commissioner:

On August 21, 1945, there was a side collision between two passenger trains on the Atchison, Topeka and Santa Fe Railway at Franconia, Ariz., which resulted in the injury of 49 passengers, 5 Pullman employees and 3 train-service employees. This accident was investigated in conjunction with a representative of the Arizona Corporation Commission.

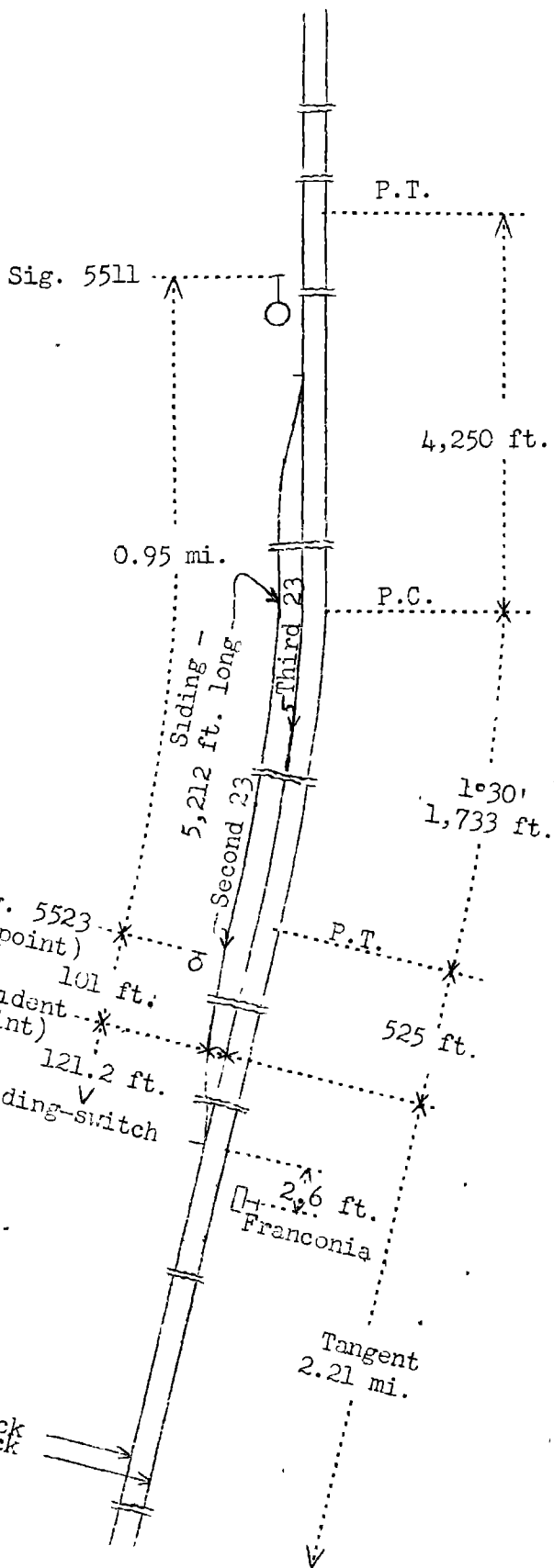
¹
Under authority of section 17 (?) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.

To Seligman →

○	Seligman, Ariz.	111.4 mi.
○	Yucca	12.5 mi.
X	Franconia, Ariz.	(Point of accident)
		25.3 mi.
○	Needles, Calif.	

← To Needles

Westward main track
 Eastward main track



Inv. No. 2925
 Atchison, Topcka and Santa Fe Railway
 Franconia, Ariz.
 August 21, 1945

Location of Accident and Method of Operation

This accident occurred on that part of the Arizona Division extending between Seligman, Ariz., and Needles, Calif., 149.2 miles, a double-track line over which trains moving with the current of traffic are operated by signal indications. At Franconia, 123.9 miles west of Seligman, a siding 5,212 feet long parallels the westward main track on the north. The west switch of this siding is a spring switch, and is 2.6 feet east of the station. The clearance point at the west end of the siding is 222.2 feet east of the west switch. The accident occurred at the fouling point of the westward main track and the turnout of the west siding-switch, at a point 101 feet west of the clearance point and 121.2 feet east of the switch. From the east there are, in succession, a tangent 4,250 feet in length, a 1°30' curve to the right 1,733 feet and a tangent 581 feet to the point of accident and 2.21 miles westward. At this point the grade is 1.0 percent descending westward.

Automatic signal 5511, governing west-bound movements on the westward main track, and automatic signal 5523, governing movements from the siding to the westward main track at the west switch, are, respectively, 5,114 feet and 101 feet east of the point of accident. Signal 5511 is of the four-indication, color-light type, and is continuously lighted. Signal 5523 is a dwarf signal of the two-indication, color-light type, and is continuously lighted. The involved aspects and corresponding indications and names of these signals are as follows:

<u>Signal</u>	<u>Aspect</u>	<u>Indication</u>	<u>Name</u>
5511	Green	Proceed.	Clear Signal.
5523)	Yellow	Proceed at restricted speed.	Restricted Speed Signal.
)	Red, with number plate	Stop-Then proceed in accordance with Rule 830.	Stop and Proceed Signal.

The track circuit of the fouling section of the turnout of the west siding-switch extends 222.2 feet east of the switch. The controlling circuits are so arranged that when a train is occupying any portion of the westward main track within a distance of 1.1 miles immediately west and 3.94 miles immediately east of signal 5523, this signal will display stop-then-proceed-at-restricted-speed.

Operating rules read in part as follows:

DEFINITIONS.

* * *

Section.--One of two or more trains running on the same schedule, displaying signals, or for which signals are displayed.

* * *

Restricted Speed.--Proceed prepared to stop short of train, obstruction, or anything that may require the speed of a train to be reduced.

11. A train finding a fusee burning on or near its track must stop and wait until it has burned out, before proceeding.

14. ENGINE WHISTLE SIGNALS.

Note.--The signals prescribed are illustrated by "o" for short sounds; "___" for longer sounds; * * *

SOUND.

INDICATION.

* * *

(c) ___ o o o Flagman protect rear of train.

* * *

15. The explosion of two torpedoes is a signal to proceed at restricted speed * * *

16. All members of train and engine crews must, when practicable, communicate to each other by its name the indication of all signals affecting the movement of their train.

37. The following signals will be used by flagmen:

Day signals -- A red flag,
Torpedoes and
Fusees.

* * *

35. * * *

A section may pass and run ahead of another section of the same schedule, first exchanging

train orders, signals and numbers with the section to be passed.

The change in sections must be reported from the next available point of communication.

99. * * *

When a train is moving under circumstances in which it may be overtaken by another train, the flagman must take such action as may be necessary to insure full protection. By night, or by day when the view is obscured, lighted fuseses must be thrown off at proper intervals.

* * *

99(C). When it is known by engineman that his train will be delayed, he will immediately whistle out flagman, * * *

330. When a train is stopped by a stop and proceed signal it may:

* * *

(b) On two or more tracks proceed at once at restricted speed.

The maximum authorized speed for trains moving through the turnout of the west siding-switch was 15 miles per hour, and for the following passenger train, 70 miles per hour.

Description of Accident

Second 23, a west-bound first-class passenger train, consisted of engine 3863, one express-refrigerator car, one baggage car, seven tourist-sleeping cars, one Pullman sleeping car, five tourist-sleeping cars, one Pullman sleeping car and one tourist-sleeping car, in the order named. The first car was of steel-underframe construction, and the remainder were of all-steel construction. About 1:46 p. m., while this train was proceeding from the siding to the westward main track at Franconia it passed dwarf signal 5523, which displayed stop-then-proceed-at-restricted-speed, and was moving at an estimated speed of 8 miles per hour when the third car was struck by Third 23 at the fouling point of the turnout of the west siding-switch and the westward main track.

Third 23, a west-bound first-class passenger train, consisted of engine 3719, one baggage car, two tourist-sleeping cars, four Pullman sleeping cars, one kitchen car and one tourist sleeping car, in the order named. All cars were of steel construction. This train passed Yucca, 12.5

miles east of Franconia and the last open office, at 1:34 p. m., 1 hour 58 minutes late, passed signal 5511, which displayed proceed, and while moving on the westward main track at an estimated speed of 40 miles per hour it struck Second 23.

The third car of Second 23 was derailed to the north and stopped on its right side at the west siding-switch. The fourth car was derailed and stopped at the rear of the third car and leaned to the north at an angle of about 45 degrees. The front truck of the fifth car was derailed. The engine of Third 23 was derailed to the right, stopped about 120 feet west of the point of collision, and leaned to the north at an angle of about 45 degrees. The third and fourth cars of Second 23 and the engine of Third 23 were badly damaged.

The weather was clear at the time of the accident, which occurred about 1:46 p. m.

The engineer, the fireman and the flagman of Third 23 were injured.

In tests after the accident the automatic block-signal system functioned properly.

Discussion

In compliance with instructions issued by the train dispatcher, Second 23 entered the siding at Franconia about 1:32 p. m. to permit No. 7, a west-bound mail-express train, to pass. No. 7 passed Franconia about 1:35 p. m. Second 23 was stopped with the engine standing at a point about 2,800 feet east of the west siding-switch until about 1:42 p. m., because a section force was engaged in performing track work on the siding. Then the section foreman permitted this train to proceed. About 4 minutes later, after Second 23 had moved westward on the siding and had passed signal 5523, which displayed stop-then-proceed-at-restricted-speed, this train was proceeding from the siding to the westward main track when the third car was struck by Third 23.

As Third 23 was approaching Franconia the speed was about 65 miles per hour, as indicated by the tape of the speed recorder. The air brakes had functioned properly en route. The crew of this train had no information that No. 7 had been instructed to pass Second 23 at Franconia. The enginemen were maintaining a lookout ahead. There was no condition of the engine that distracted the attention of the enginemen or obscured their view of the track ahead. Signal 5511, located 0.95 mile east of the west siding-switch, displayed proceed and the enginemen called the indication. From this point westward, because of the curve and a high embankment adjacent to the track, the view had by the enginemen of the west portion of the siding was materially restricted. When the engine was about 3,000

feet east of the west siding-switch the engineer observed that a passenger train was occupying the siding, and he made a 10-pound brake-pipe reduction to control the speed of his train so that he could identify the train on the siding and exchange signals if necessary. When his engine was about 1,600 feet east of the west siding-switch he observed that the train on the siding was moving westward and that the front portion was occupying the main track. He immediately moved the brake valve to emergency position, but the collision occurred before Third 23 could be stopped.

When Second 23 was moving westward on the siding, the enginemen and the front brakeman were on the engine, the conductor was in the seventh car and the flagman was on the rear platform of the rear car. The engineer said he did not sound the whistle signal calling for flag protection, but he expected that flag protection, if required, would be provided by the flagman. He thought signal 5523 displayed proceed-at-restricted-speed when his engine was some distance east of the signal, but none of the employees on the engine observed the indication displayed during the time the engine was in the immediate vicinity of the signal. The front brakeman alighted when the engine was a short distance east of the west siding-switch in order to throw the switch, as he did not know it was a spring switch. Immediately afterward he became aware that Third 23 was closely approaching, but the collision occurred before he could warn the engineer. The other members of the crew, except the flagman, were not aware of anything being wrong until immediately prior to the accident.

The flagman of Second 23 said that soon after No. 7 passed the rear of his train he placed two torpedoes on the north rail of the westward main track about 4,000 feet east of the west siding-switch and, when his train started to move westward, he placed a lighted 5-minute fusee on the westward main track in the vicinity of the location of the torpedoes. Then when the rear of his train was about 1,800 feet east of the west siding-switch, he dropped another lighted fusee. Soon afterward he saw the approaching train and alighted, and was giving stop signals with a red flag when the engine of Third 23 passed him. However, the enginemen of Third 23 were positive that no warning signal was seen or heard prior to the collision. The engineer said that when his engine passed the rear of Second 23 he saw the flagman of Second 23 standing on the rear platform of the rear car, but no warning signal was given. The flagman of Third 23 and the section foreman said that they saw a burning fusee about 1,800 feet east of the west siding-switch immediately after the accident.

In this territory trains are operated by signal indication. The west siding-switch is a spring switch and therefore, provided that the signal displays a yellow aspect, a west-bound train may enter the main track at the west end of the siding without stopping for the switch to be operated manually. The

engineer of Second 23 said if he had observed that this signal was displaying a red aspect; he would have stopped his train short of it and then proceeded immediately, as he would have thought that No. 7 in the block to the west was causing the signal to display red. The control circuit of signal 5523 is so arranged that when a train is occupying the westward main track between points 1.1 miles immediately west and 3.94 miles immediately east of signal 5523, this signal will display stop-then-proceed-at-restricted-speed. Third 23 was moving at a speed of about 65 miles per hour when it entered the east end of the control circuit of signal 5523 and, since no restrictive indication was displayed by signal 5511 and no flagman's warning signal was seen or heard, this speed was maintained until the engineer saw the train on the siding. Based on an average speed of 65 miles per hour, an interval of approximately 3 minutes 30 seconds elapsed between the time Third 23 entered the control circuit of signal 5523 and the time the accident occurred. Therefore, it is evident that this signal was displaying stop-then-proceed-at-restricted-speed for Second 23 during that interval of time. In tests after wires leading to signal 5523 which were damaged in the accident had been repaired, the signal functioned properly. However, the most restrictive indication displayed by this signal requires only that a train must stop at the signal, then it may immediately proceed, but must be prepared to stop short of a train or an obstruction. If the members of the crew on the engine had observed the indication displayed by signal 5523 and had stopped their train in compliance with the indication, the train could have proceeded immediately and fouled the main track immediately in front of the approaching train, the same as occurred in the present case. However, if the rules had required Second 23 to remain in the siding as long as signal 5523 displayed red, and if the indication was obeyed, this accident would not have occurred. The provision made for safeguarding such movements was the general requirement that the flagman take such action as necessary to insure full protection. In this case the flagman of Second 23 thought the protection he provided for his train was sufficient. The engineer of Third 23 said that if a lighted fusee or torpedoes had been placed in the immediate vicinity of the east siding-switch, he could have taken action to stop his train in time to avert the accident.

In addition to the present accident, during the past 2-1/2 years the Commission has investigated ten accidents in which trains, without providing adequate protection, fouled the main track immediately in front of an approaching train, such as occurred in this case. These accidents resulted in the death of 48 and the injury of 211 persons. Of these, nine occurred in territory where the operation was by timetable, train orders and automatic block-signal system, and one occurred in territory where the operation was by timetable

and train orders. Of the accidents which occurred in automatic block-signal territory, one involved movement through a spring switch.

During the 30-day period preceding the day of the present accident, the average daily movement on this district was 66.8 trains. The maximum authorized speeds in this territory are 100 miles per hour for passenger trains hauled by Diesel electric engines, 70 to 80 miles per hour for passenger trains hauled by steam engines and 50 miles per hour for freight trains. In view of the conditions here present, the arrangement of signals at this location does not provide adequate protection for movements from siding to main track.

Cause

It is found that this accident was caused by a train fouling the main track immediately in front of a following train.

Recommendation

It is recommended that the Atchison, Topcka and Santa Fe Railway Company provide adequate protection for movements from siding to main track.

Dated at Washington, D. C., this tenth day of October, 1945.

By the Commission, Commissioner Patterson:

W. P. BARTEL,

(SEAL)

Secretary.