

INTERSTATE COMMERCE COMMISSION

WASHINGTON

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REPORT OF THE DIRECTOR

BUREAU OF SAFETY

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ACCIDENT ON THE

CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC  
RAILROAD

---

ELKHART LAKE, WIS.

---

DECEMBER 16, 1939

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INVESTIGATION NO. 2393

- 2 -

SUMMARY

Inv-2398

Railroad: Chicago, Milwaukee, St. Paul and Pacific  
Date: December 16, 1939  
Location: Elkhart Lane, Wis.  
Kind of accident: Derailment  
Train involved: Passenger  
Train number: 19  
Engine number: 177  
Consist: 4 cars  
Speed: 58 m. p. h.  
Operation: Timetable, train orders and manual  
block system  
Track: Single; 2° curve; 0.91 percent ascending  
grade for west-bound trains.  
Weather: Clear  
Time: 8:49 p. m.  
Casualties: 12 injured  
Cause: Excessive speed when entering an open  
switch to a siding because ins-truc-  
tion to take siding was omitted from  
train order delivered to train in-  
volved.

Inv-2398

January 31, 1940

To the Commission:

On December 16, 1939, there was a derailment of a passenger train on the Chicago, Milwaukee, St. Paul and Pacific Railroad at Elkhart Lake, Wis., which resulted in the injury of six passengers, one express messenger, one employee off duty, and four employees on duty.

#### Location and Method of Operation

This accident occurred on that part of the Superior Division designated as the First Subdivision which extends between North Milwaukee and Green Bay, Wis., a distance of 104 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 a manual block system. At Elkhart Lake a siding 4,161 feet in length parallels the main track on the north; the accident occurred at the frog of the east switch of this siding, which was located about 4,150 feet east of the Elkhart/Lake station. Entry to the east leg of a Y is made through a switch located at a point 360 feet west of the east siding-switch. Approaching from the east there is a tangent 4,593 feet long, which is followed by a 2° curve to the left 1,235 feet to the point of accident and 791 feet beyond. The grade for west-bound trains is ascending a distance of 3,945 feet and is 0.91 percent a distance of 1,025 feet to the east switch.

The main-track structure consists of 90-pound rail, 39 feet in length, laid on an average of 24 hardwood ties to the rail length; it is single-spiked, fully tieplated, ballasted with gravel to a depth of 8 to 12 inches and is well maintained. The siding-track structure is the same as the main track a distance of 110 feet west of the east switch and from that point, which is approximately one rail length west of the frog, it consists of 75-pound rail, 28 feet in length, laid on hardwood and softwood ties and, for a siding track, is well maintained. The siding, which is 4 to 6 inches lower than the main track, has a super-elevation of about 1 inch and at the point of accident is laid on a 6-foot fill.

The switch involved is a facing-point switch for west-bound trains. Entry to the siding is made through a No. 10 turnout, which has a 78-foot 11-inch lead laid on an alignment of 3°36' curvature with maximum super-elevation of 5-1/2 inches. The turnout is equipped with a 15-foot, 90-pound spring frog.

Direction  
of No. 19

4,897 ft.  
tangent

1,235 ft.

PC

Point of initial derailment

360 ft.

20°

Point of general derailment

2,026 ft.

PT

4,121 ft.

3,000 ft.

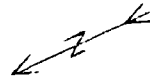
Siding

PC

ELKHART LAKE

Direction  
of No. 74

o	No. Milwaukee, Wis.
	9.0 mi.
o	Thiensville
	11.1 mi.
o	Saukville
	12.0 mi.
o	Random Lake
	14.0 mi.
o	Plymouth
	6.8 mi.
o	Point of accident Elkhart Lake
	5.8 mi.
o	Kiel
	18.1 mi.
o	Hilbert
	27.2 mi.
o	Green Bay, Wis.



Inv. No. 2398  
C.M. St. P. & P. R.P.  
Elkhart Lake, Wis.  
Dec. 16, 1919

The switch stand, which is located on the north side of the track, is of the Woodworth No. 1 type and is equipped with a horizontal target 2 feet 6 inches long and 15 inches wide, on which are painted alternately red and white stripes, each approximately 6 inches wide. The target center is 5 feet 3 inches above the head block and is displayed only when the switch is lined for a movement to the siding. A lamp, which displays a red aspect when the switch is lined for the siding, is located on top of the target 7 feet above the head block.

The consolidated code of transportation rules and general instructions provide in whole or in part as follows:

202. Each train order must be given in the same words to all employes or trains addressed.
205. Each train order must be written in full in a book provided for the purpose at the office of the train dispatcher; and with it recorded the names of those who have signed for the order; the time and the signals which show when and from what offices the order was repeated and the responses transmitted; and the train dispatcher's initials. These records must be made at once and never from memory or memoranda.
206. \* \* \*
- When train orders are transmitted by telegraph, the train dispatcher must underscore each word and figure at the time it is repeated. \* \* \*
- \* \* \*

The telegraph is used for transmission of train orders.

The maximum authorized speed for passenger trains on the main track is 70 miles per hour and through turnouts is 15 miles per hour.

The weather was clear at the time of the accident, which occurred at 8:49 p. m.

#### Description

No. 74, an east-bound second-class freight train, with Conductor Krause and Engineer Lindner in charge, consisted of engine 593, 42 loaded cars and a caboose. This train departed from Green Bay, 51.1 miles west of Elkhart Lake, at 6:35 p.m.,

according to the train sheet, 40 minutes late. At Hilbert, 23.9 miles west of Elkhart Lake, the crew received the following train orders:

Form 19: No 19 meet No 14 at Thiensville  
No. 47: and No 74 at Plymouth No 19 take  
siding at Plymouth

Form 31: No 19 meet No 74 at Elkhart Lake  
No. 51: instead of Plymouth No 19 take  
siding

This train departed from Hilbert at 7:43 p. m., passed Kiel, the last open office, 5.8 miles west of Elkhart Lake, at 8:25 p. m., 49 minutes late, where the crew received a Clearance Form A which read as follows:

No orders for your train. Block  
clear except No. 19. Stop indication  
is displayed for No. 74 to meet No. 19  
as per order No. 31.

No. 74 arrived at Elkhart Lake about 8:42 p. m., stopped on the main track clear of the east switch of the siding and a member of the crew opened the switch for No. 19 to enter the siding.

No. 19, a west-bound first-class passenger train, with Conductor Kane and Engineman O'Neill in charge, consisted of engine 177, of the 4-6-2 type, one mail-express car, two coaches, and one parlor car, in the order named; all cars were of steel construction. At Milwaukee, 61.2 miles east of Elkhart Lake, the crew received two train orders, Form 19, reading as follows:

No. 47: No 19 meet No 14 at Thiensville  
and No 74 at Plymouth No 19  
take siding at Plymouth

No. 48: All first class trains due at  
North Milwaukee and Green Bay  
at or before 545 pm have arrived  
and left

This train passed North Milwaukee, 52.9 miles east of Elkhart Lake, at 7:19 p. m., according to the train sheet, on time. At Random Lake, 20.8 miles east of Elkhart Lake, the crew received train order No. 51, Form 19, reading as follows:

No 19 meet No 74 at Elkhart Lake  
instead of Plymouth

This train departed from Random Lake at 8:17 p. m., 6 minutes late, and departed from Plymouth, 6.8 miles east of Elkhart Lake, at 8:42 p. m., 8 minutes late, where the crew received a Clearance Form A which read as follows:

No orders for your train. Block  
clear except No 74 Stop indication  
is displayed for No 19 to meet No 74  
as per order No. 51

This train entered the open switch at the east end of the siding at Elkhart Lake and was derailed while moving at a speed of 58 miles per hour as recorded on the locomotive speed-recorder tape.

The initial derailment occurred at the frog of the east siding-switch and the general derailment occurred at the switch to the east leg of the Y. The engine and the tender remained coupled and stopped down the embankment on the north side of the track; the engine was practically upside down and the tender leaned at an angle of about 45 degrees. The remainder of the train was derailed to the north side of the track and stopped to the rear of the locomotive. The first and third cars leaned at an angle of about 45 degrees; the second car stopped on its side and the fourth car remained upright. None of the equipment was seriously damaged. About 420 feet of the siding and about 190 feet of the Y were torn up.

The employees injured were the fireman, the baggageman, the flagman, and the brakeman of No. 19.

#### Summary of Evidence

Engineman Lindner, of No. 74, stated that he received train orders Nos. 47 and 51 at Hilbert. The front brakeman and the fireman read them and everyone on the engine understood that his train would meet No. 19 at Elkhart Lake and No. 74 was to hold the main track at that point. After taking coal at Elkhart Lake, the train proceeded eastward and stopped on the main track about four car lengths west of the east siding-switch at 8:42 p. m. The front brakeman went ahead and opened the switch for No. 19 to enter the siding. Engineman Lindner heard No. 19 whistling for the road crossing and immediately, and before No. 19 came into view, he dimmed the headlight on his engine. The curve east of the switch restricted his view of a west-bound train to about 400 feet. He observed fire flying from the wheels when No. 19's engine passed over the frog of the switch and soon afterward the train was derailed. He stated that the accident occurred at 8:49 or 8:50 p. m.

Fireman Shemick, of No. 74, corroborated the statement of his engineman.

Front Brakeman Durben, of No. 74, stated that after his train arrived at Elkhart Lake he went ahead and opened the switch for No. 19 to enter the siding and observed that it was then 8:43 p. m. He walked away from the switch and when No. 19's headlight came into view he raised his lantern once to give the engineman a proceed signal in order to let him know that the switch was lined for the siding. No. 19 came into view at a point about 300 or 400 feet east of the switch and it was too late to flag that train when he realized that it was moving too fast to enter the siding safely.

Conductor Krause, of No. 74, stated that he received train orders Nos. 47 and 51 at Hilbert and that he and the engineman compared copies and understood them.

The statement of Rear Brakeman Santamour, of No. 74, added nothing of importance.

Engineman O'Neill, of No. 19, stated that an air-brake test was made at Milwaukee and he received train orders Nos. 47 and 48 at that point. At Random Lake he received from the operator order No. 51 which changed the meeting point with No. 74 to Elkhart Lake instead of Plymouth but this order contained no instruction for No. 19 to take siding. After leaving Plymouth he heard the meeting-point signal sounded on the train air-signal system and he acknowledged it by sounding the engine whistle. He then sounded the engine whistle for the road crossing located at the east end of the siding at Elkhart Lake and before he had completed the crossing whistle-signal the fireman called a warning to stop. He immediately placed the brake valve in emergency position and observed at that time that the speedometer was registering 60 miles per hour. After he made the emergency application of the brakes the train rounded the curve to a point where the switch stand came into his view and he observed that the target and the red light were displayed. The brakes responded properly but the distance was too short for the speed to be reduced appreciably before the train entered the switch.

Fireman Corr, of No. 19, corroborated the statement of his engineman and added that he first observed the switch target when the beam from the headlight shone on it as the engine rounded the curve. The speed of the train was about 60 miles per hour when it entered the open switch.



Conductor Kane, of No. 19, stated that he received train orders Nos. 47 and 48 at Milwaukee. When the station stop was made at Random Lake he went to the telegraph office for the orders and met the operator who was delivering the engineman his copy. He asked the operator for his orders and was told that they were on the desk in the office. The operator's father was in the office and the conductor asked him where the flagman's orders were and was told that they were in the delivery hoop. The conductor obtained the flagman's orders and when delivering them to the flagman they exchanged remarks about being in luck since they did not have to take siding at Elkhart Lake to meet No. 74. He stated that he could not tell whether the operator was excited because this operator was always in a hurry. After the train left Plymouth, the brakeman sounded the meeting-point signal on the train air-signal system and this signal was acknowledged by the engineman. Soon afterward the train became derailed. The accident occurred at 8:49 p. m., at which time the weather was clear.

The statements of Brakeman Lange and Flagman Bordeleau, of No. 19, added nothing of importance.

Operator Jentges stated that he was 22 years of age and had worked as an extra operator on this division since August 1938. He went on duty at Random Lake at 8 p. m. on the day of the accident in the place of the regular operator, who was sick. The first train order he received was order No. 53 addressed to the operator; this order, which was completed at 8:06 p. m., provided that No. 9 would meet No. 74 at Saukville. He then received for No. 19 order No. 51, which read: "No. 19 meet No. 74 at Elkhart Lake instead of Plymouth." This order was repeated by him and made complete by the dispatcher at 8:10 p. m. He said that when receiving this order over the telegraph he omitted the words "Elkhart Lake" in order to keep up with the sender, and then filled them in before repeating the order. Soon after he went on duty his father, a retired agent-operator, came into the office and he, also, copied order No. 51 as it was received and checked it as it was repeated. He said that a track foreman and the agent were in the office and while he was busy with the train orders the agent sold a ticket to a woman passenger who was in the waiting room. After order No. 51 was made complete, he wrote out the clearance card for No. 19 and repeated it to the dispatcher. The approval of the dispatcher was received at 8:12 p. m. No. 19 arrived at the station at 8:12 p. m. When he took the express and mail out to the train he took a copy of order No. 51 and the clearance card to deliver to the engineman. When he was leaving the office, someone said that the platform lights were not burning; he turned them on and then ran with his truck to the express

car. On the way he met the conductor of No. 19 who inquired about his orders and was told that they were on the desk. He unloaded the express and mail and then ran around to the left side of the engine and gave the engineman, who was oiling the engine on that side, the order and the clearance card. The first he knew of anything being wrong was when the dispatcher called him about 9 p. m. and asked him to repeat order No. 51. He repeated the order and then the dispatcher asked him if that was all he had on it, and he replied that it was. The dispatcher told him to get the trainmaster off No. 9. When the trainmaster arrived he asked the operator for the file copy of order No. 51 and the clearance card issued to No. 19. Operator Jentges gave the trainmaster the office copy of the train order, but he did not have a copy of the clearance card because he had been busy at the time he made it out and failed to make enough copies. At first he said that the dispatcher had not asked him whether he recopied order No. 51 but in a later statement he said that the dispatcher had asked him if he copied the order and his reply was that he had copied it. He had been in Milwaukee during the day of the accident and was called on short notice to work the night trick at Random Lake. He said that he had little recent experience with the telegraph and also he was handicapped on the night of the accident by a split thumb. The only trouble he had experienced previously occurred in September, 1939, when he had been called for the night trick at Hilbert. On that day he had been practically without rest all day and after going to work he got so sleepy he could not receive train orders by telegraph and had to use the telephone to understand them.

J. Jentges, father of Operator Jentges, stated that he went with his son for the first few days after he was called to work at a station. On the night of the accident he was with his son at Random Lake and copied every order that his son copied in order to check his work. He stated that he neither heard the dispatcher ask if order No. 51 had been recopied nor heard him ask if it had been copied. He was unable to exhibit the copy of order No. 51 he had made, and he stated that he had crumpled it and thrown it in the fire after the order was made complete. He had worked at Random Lake for 33 years prior to his retirement in 1937.

Operator Bennett, on duty at Hilbert, stated that he neither heard the dispatcher send order No. 51 nor heard it repeated. He did hear the dispatcher ask the operator at Random Lake if he had recopied order No. 51 and the operator's answer was, "yes."

Operator Hermansen, on duty at Plymouth, stated that she neither heard the dispatcher send order No. 51 nor heard it repeated. She did hear the dispatcher ask the operator at Random Lake if he recopied order No. 51 and the operator's answer was, "yes."

Dispatcher Graco, on duty at Green Bay, stated that he sent order No. 47 to No. 19 at Milwaukee establishing a meeting point between No. 19 and No. 74 at Plymouth and that No. 19 was instructed to take siding at Plymouth, but later he wished to advance No. 19 to Elkhart Lake to meet No. 74 and, as the office at Random Lake did not open until 8 p. m. he simultaneously sent order No. 51, on Form 31, to No. 74 at Hilbert and on Form 19 to the operator at Plymouth. Order No. 51 read as follows: "No. 19 meet No. 74 at Elkhart Lake instead of Plymouth No. 19 take siding." The order to No. 74 was completed at 7:53 p. m. The operator at Kiel did not answer at first, but 6 or 7 minutes after the order was sent to the operators at Hilbert and Plymouth he came on the wire and said that he had received it; after repeating the order he received the complete on it at 7:40 p. m. The dispatcher had started to send order No. 53 to No. 9 establishing a meeting point between that train and No. 74 at Saukville when the operator at Random Lake came on the wire and for this reason order No. 53 was sent to the operator at Random Lake ahead of order No. 51. When the operator signed for order No. 53 he learned that Operator Jentges instead of the regular operator was on duty. This order was completed to Random Lake at 8:06 p. m. Realizing that Jentges was an inexperienced operator the dispatcher changed from the sending machine and sent order No. 51 by the conventional key in order to send more slowly and distinctly for the inexperienced operator. The operator did not open the telegraph circuit or ask any questions about the order. The operator repeated the order exactly as it was sent, including the instruction for No. 19 to take siding, and as the order was repeated the dispatcher underscored each word in his book. Order No. 51 was completed to Random Lake at 8:10 p. m. About 8:55 p. m. he called Plymouth to ascertain the location of No. 74 since that train had an order to meet No. 9 at Saukville and he desired to avoid delay to No. 9. The operator advised him that something had happened to No. 19 at Elkhart Lake. About 10 minutes later the roadmaster, who was on No. 19, called and gave him the details of the accident. The dispatcher asked the operator at Random Lake to repeat order No. 51 and then learned that the instruction for No. 19 to take siding did not appear on the copies of the order delivered to the crew of No. 19. He asked the operator whether he had recopied the order and the operator replied, "yes." In order to verify this statement he called the operator on the telephone about 9:45 p. m. and asked him whether he had recopied order No. 51 and the operator again replied that he had done so. The dispatcher said that since the investigation had disclosed that the operator omitted the words "Elkhart Lake" from the order and filled them in later, he thought that the operator repeated the order before writing all words, and then failed to write the words, "No. 19 take siding," on the order after repeating it. On the day of the accident he issued 19 train orders during his trick; the work was normal as all west-bound trains were on time. He has had 22 years experience as a train dispatcher on this division.

Roadmaster Carlson, who was on No. 19 at the time of the accident, stated that the first marks of derailment appeared at a point 4 feet west of the point of the frog of the east siding-switch. It was his opinion that the engine truck was derailed at the frog. Marks on the ties extended a distance of about 250 feet to the Y switch where the general derailment occurred. The track in the vicinity of the Y switch was torn out.

According to the speed-recorder tape which was removed from engine 177, the speed of No. 19 at a point about 1/2 mile east of the point of accident was 62 miles per hour. From that point the speed of the train decreased to the point of accident and it was 58 miles per hour at the point of accident.

An original copy of train order No. 51 as delivered to No. 19 at Random Lake shows the order to be written in the following manner:

No 19 meet No 74 at  
Elkhart Lake instead of  
Plymouth.

The words "Elkhart Lake" are evenly spaced in relation to the other words of the order.

Records furnished by the railroad show that prior to the day of the accident, Operator Jentges' service consisted of 139 days worked at various places since August, 1938, and the only previous experience at Random Lake was 3 days from January 31 to February 3, 1939. Train Dispatcher Grade is 42 years of age, was employed as an operator in February, 1909, promoted to dispatcher May 30, 1917, and has worked continuously as a dispatcher since that time. His record for the entire period is clear.

During the 50-day period preceding the day of the accident the average daily movement over the territory involved was 12.2 trains.

#### Observations of Commission's Inspectors

The Commission's inspectors examined the track and found a light flange mark on top of the frog and also light flange marks on 12 ties immediately west of the frog; these marks apparently were made by engine-truck wheels.

The inspectors checked the train dispatchers' train-order book and found that order No. 51 read as stated by the train dispatcher. It was sent simultaneously to the operators at Hilbert, Plymouth, and Kiel, and was addressed on Form 31 to No. 74 at Hilbert and on Form 19 to the operators at Plymouth and Kiel; it was made complete to Hilbert at 7:33 p. m., to Plymouth at 7:34 p. m., and to Kiel at 7:40 p. m.; it was sent to the operator at Random Lake, addressed on Form 19 to No. 19, and was made complete at 8:10 p. m. The order was underscored three times and the record indicates that the operator at Random Lake repeated order No. 51 in full.

#### Discussion

According to the evidence order No. 51 changed the meeting point between Nos. 19 and 74 from Plymouth to Elkhart Lake, but on the copy delivered to the crew of No. 19 the instruction for No. 19 to take siding was omitted. The copy of the order delivered to the crew of No. 74 contained the instruction for No. 19 to take siding. No. 74 stopped at Elkhart Lake on the main track clear of the east switch to the siding and a member of the crew lined the switch for No. 19 to enter the siding. The engineer of No. 19, being unaware of the instruction for his train to take siding, was operating his train at a speed of about 60 miles per hour around the 2<sup>o</sup> curve on which the east siding-switch is located. The fireman called a warning to the engineer immediately after the switch target came into his view and the engineer placed the brake valve in emergency position; the brakes responded properly in the short distance available to the switch, but the speed of the train was 58 miles per hour at the switch. The lurch of the engine resulting from the high rate of speed through the No. 19 turnout apparently raised the engine-truck wheels high enough for the flange of an engine-truck wheel to fall upon the ball of the rail at the frog and then the wheels dropped to the ties and continued thereon until the Y switch was reached, where the entire train became derailed.

According to the evidence order No. 51 was sent to No. 74 at Hilbert and to the operators at Plymouth and Kiel at 7:33 p. m. and No. 74 departed from Hilbert at 7:43 p. m. The office at Random Lake was not opened until 8 p. m., and at that time order No. 53 establishing a meeting point between No. 9 and No. 74 at Saukville was being sent. Since order No. 53 was addressed also to the operator at Random Lake this order was sent to Random Lake before order No. 51. The dispatcher stated that when order No. 51 was sent to Random Lake the instruction for No. 19 to take siding was sent and that it was repeated by the operator. The operator at Random Lake said that the instruction for No. 19 to take siding was neither sent nor repeated.

Order No. 51 was properly underscored in the dispatchers' record book, each word being underscored three times. This fact indicated that the instruction for No. 19 to take siding had been sent to Random Lake and had been repeated by the operator. About an hour after the accident the dispatcher asked the operator whether he had recopied the order and the operator replied that he had done so; this answer was heard by the operators at Plymouth and Hilbert. In his first statement the operator stated that the dispatcher had not asked him whether he had recopied the order but later, after being confronted by the dispatcher's statement, he said that the dispatcher had asked him whether he had copied the order and he replied that he had. The operator's father, who accompanied his son when he went to a new station, stated that he neither heard the dispatcher ask if the order had been recopied nor heard him ask if it had been copied. The operator's father said that he had copied the order on a piece of paper at the time it was sent and that the instruction to take siding was not sent; however, he was unable to exhibit the copy he had made, and he said he had thrown it into the fire after the order was made complete. The father was depending on his memory as no question about the order was raised until about an hour after the order was made complete.

The operator stated that he omitted the words "Elkhart Lake" when he was copying order No. 51; he did this in order to keep up with the sender and then he filled in the words before repeating the order. However, the words in the order are evenly spaced which indicates that they were written in consecutive order; it seems improbable that words could be left out and then supplied later without crowding the words or leaving one or more long spaces. There was ample time for the operator to recopy the order; he had not less than 2 minutes from the time the dispatcher completed it to the time No. 19 arrived. At a medium rate of speed a person could write in 45 seconds all the written characters appearing on the copies delivered by the operator, and the clearance card could be prepared and compared with the dispatcher and the block obtained in 45 seconds.

The dispatcher was an experienced employee; that the operator was inexperienced is indicated by the fact that his father accompanied him to check his work. The dispatcher had sent order No. 51 to three operators before sending it to the operator at Random Lake. The dispatcher had copied the order in his book when the first operator repeated and had underscored the order when the next two operators repeated. He then sent the order to Random Lake. Realizing that the operator was inexperienced the dispatcher used the conventional telegraph key in order to send slowly, which would indicate that he

was using extra precaution. The order was short and it appears improbable that the dispatcher would stop in the middle of the order and fail to send the last part of it as he was sending from the copy recorded in his book. It also appears improbable that when the dispatcher was under scoring the order as the operator at Random Lake was repeating that he would fail to observe that the operator omitted the last four words of the order.

#### Conclusion

This accident was caused by excessive speed when entering an open switch to a siding because the instruction to take siding was omitted from the train order delivered to the train involved.

Respectfully submitted,

S. N. MILLS,

Director.