

INTERSTATE COMMERCE COMMISSION  
WASHINGTON

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REPORT OF THE DIRECTOR  
BUREAU OF SAFETY

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ACCIDENT ON THE  
CHICAGO & NORTH WESTERN RAILWAY

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BESSEMER, MICH.

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JUNE 12, 1940

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INVESTIGATION NO. 2432

-2-

SUMMARY

Inv-2432

Railroad:	Chicago & North Western
Date:	June 12, 1940
Location:	Eessemer, Mich.
Kind of accident:	Head-end collision
Trains involved:	Freight : Freight
Train numbers:	Extra 2419 : Extra 3004
Engine numbers:	2419 : Soo 3004
Consist:	26 loaded cars : 97 empty cars and caboose
Speed:	15-25 m. p. h. : 10-15 m. p. h.
Operation:	Timetable and train orders
Track:	Single; 3 <sup>0</sup> curve; 1.22 percent grade ascending westward
Weather:	Clear
Time:	2:15 p. m.
Casualties:	1 killed; 5 injured
Cause:	Failure of the crew of Extra 2419 to obtain definite information concerning arrival of the opposing extra train and failure to operate both trains under proper control within yard limits.

August 3, 1940.

To the Commission:

On June 12, 1940, there was a head-end collision between two freight trains on the Chicago & North Western Railway near Bessemer, Mich., which resulted in the death of one employee and the injury of five employees.

#### Location and Method of Operation

This accident occurred on that part of the Ashland Division designated as Subdivision 5 which extends between Watersmeet, Mich., and Ashland, Wis., a distance of 98.3 miles. In the vicinity of the point of accident this is a single-track line over which at the time of the accident trains were operated by timetable and train orders; no block system was in use. The accident occurred on the main track within yard limits at a point 6,897 feet west of the station at Bessemer; the west yard-limit board is located 8,939 feet west of the station, and the west siding-switch is located 705 feet west of the station. As the point of accident is approached from the east there are, in succession, a  $3^{\circ}$  curve to the left, 835 feet in length; a tangent, 765 feet in length; a  $2^{\circ}$  curve to the right, 1,575 feet in length; a tangent, 2,510 feet in length; and a  $3^{\circ}$  curve to the right, 1,615 feet in length; the accident occurred on the last-mentioned curve at a point 721 feet west of its eastern end. As the point of accident is approached from the west there are, in succession, a tangent, 5,198 feet in length; a  $4^{\circ}$  curve to the right, 1,230 feet in length; a tangent, 100 feet in length; and the  $3^{\circ}$  curve on which the accident occurred. The grade for west-bound trains is level a distance of 2,000 feet, then varies between 0.16 and 1.43 percent ascending a distance of 1,748 feet to the point of accident, at which point it is 1.22 percent. The grade for east-bound trains varies between 0.05 and 1.50 percent descending a distance of 7,422 feet to the point of accident. At the point of accident the range of vision of the engine crew of either an east-bound or a west-bound train is restricted to a distance of about 325 feet because of track curvature, a cut about 12 feet in depth, and a thick growth of brush and small trees along the track.

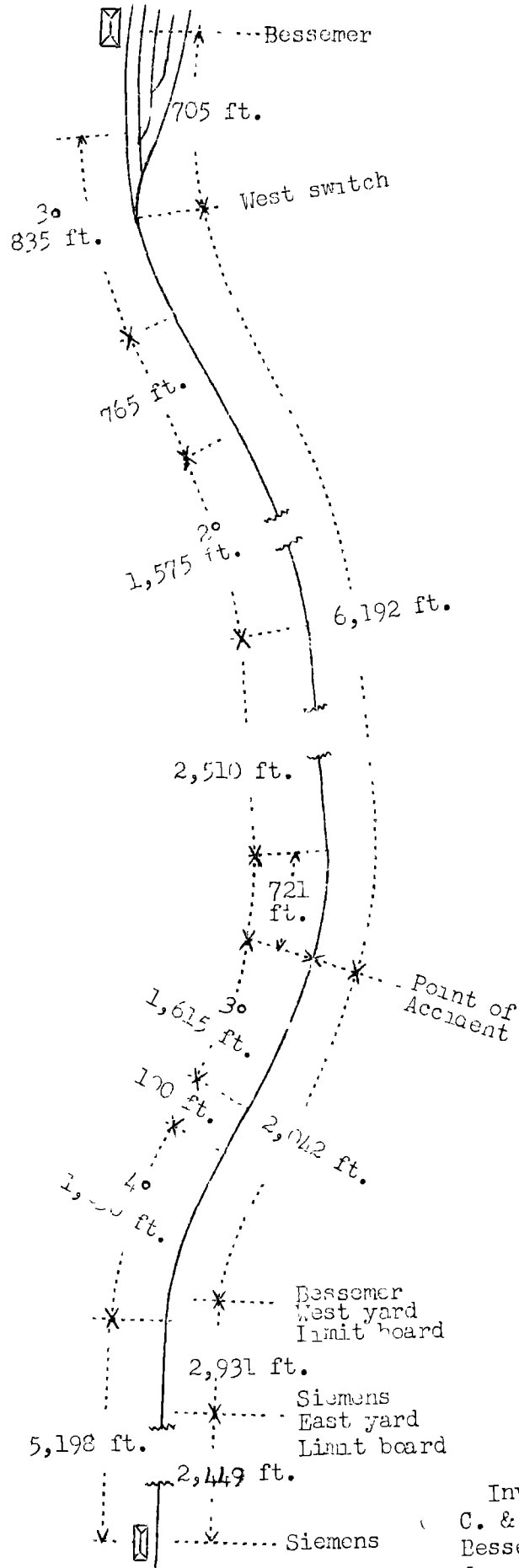
Rules for the Government of the Operating Department referred to in this report read in whole or in part as follows:

#### Definitions

\* \* \*

Train.-- An engine or motor car or more than one

- o Watersmeet, Mich.  
46.2 mi.
- o Wakefield  
5.7 mi.
- o Bessemer  
1.3 mi.
- X Point of accident  
1.2 mi.
- o Siemens  
3.8 mi.
- o Ironwood, Mich.  
40.1 mi.
- o Ashland, Wis.



Inv-2432 -  
C. & N. W. Ry.  
Bessemer, Mich.  
June 12, 1940

engine or motor car coupled, with or without cars, displaying markers.

S-97. \* \* \*

Extra trains \* \* \* will be governed by train orders with respect to opposing extra trains.

91. Unless some form of block signals is used, the time space to be maintained between trains in the same direction will be regulated by special rule on each division time-table. This rule will not relieve trainmen from observing all rules in regard to the protection of their trains.

93. All second and third class and extra trains must approach and pass all stations, yards, sidings, fuel and water stations, expecting to find trains or yard engines occupying the main track within the switches or yard limits, or taking fuel and water and will be prepared to stop unless the main track is seen or known to be clear. Trains and yard engines may use the main track at such points, protecting against first class trains in all cases and will protect against all trains where the view is obscured by fog, storms or track curvature, or other causes requiring additional safeguards.

\* \* \*

S-206b. Except in automatic block districts, a "19" train order restricting the superiority of a train over an opposing train will not be sent to the point where such superiority is restricted.

211. \* \* \*

When a "19" train order restricting the superiority of a train is issued for it at the point where such superiority is restricted, the train must be brought to a stop before delivery of the order.

\* \* \*

Special instructions contained in the current timetable are as follows:

### BLOCKING

Time                   \* \* \* Trains will be spaced 15  
Spacing               minutes apart, except eastward  
Rule 91               freight trains between Ashland  
                         and Orva, and eastward and westward  
freight trains between Bessemer and east end  
Siemens yard, will be spaced 10 minutes apart.

\* \* \*

The weather was clear at the time of the accident, which occurred about 2:15 p. m.

### Description

Extra 2419, a west-bound freight train, with Conductor Ferguson and Engineman Schwartz in charge, consisted of engine 2419, 80 loaded cars, and a caboose. This train departed from Wakefield, 5.7 miles east of Bessemer, at 11:30 a. m., according to the train sheet, and arrived at Bessemer at 12:37 p. m. Because of the heavy ascending grade for west-bound trains between Bessemer and Siemens, 2.5 miles west of Bessemer, the rear portion of the train was left at Bessemer and Soo engine 3004, coupled ahead, assisted engine 2419 in hauling 52 loaded cars to Siemens. At Bessemer the crew received a copy of train order No. 227, Form 19, reading as follows:

Eng 2419 run Extra Bessemer to Siemens with  
right over No. 52. No. 52 gets this at Siemens.  
This order annulled at one ten 110 pm.

The flagman was left at Bessemer and the front portion of the train departed about 12:50 p. m. and arrived at Siemens at 1 p.m. At Siemens engine 3004 was detached and it returned to Bessemer. Engine 2419 placed the cars in the yard, then closely followed engine 3004 to Bessemer. Both engines made the return movement under flag protection. After the crew of engine 2419 ate lunch at Bessemer, engine 2419 was coupled to 26 cars to go to Siemens. When the engine was passing the station at Bessemer, the crew received train order No. 238, Form 19, which was addressed to C. & E. Eng. 2419 and the operator at Bessemer and made complete at 1:56 p. m., reading as follows:

After Extra Soo 3004 east arrives at Bessemer  
Eng 2419 run Extra Bessemer to Siemens.

This portion of the original train departed from Bessemer about 2:10 p. m., and, while moving at a speed estimated to have been between 15 and 25 miles per hour, collided with Extra 3004 East.

Extra 3004, an east-bound freight train, with Conductor Drengler and Engineman Paull in charge, consisted of Soo engine 3004, and a caboose. This train departed from Ironwood, 6.3 miles west of Bessemer, at 11:40 a. m., according to the train sheet, passed Siemens at 12:05 p. m., and arrived at Bessemer at 12:15 p. m. Engine 3004 was then double-headed with engine 2419 from Bessemer to Siemens and it returned to Bessemer, as previously described. At Bessemer the conductor received a copy of train order No. 230, Form 19, which was made complete at 12:52 p. m., reading as follows:

Eng Soo 3004 run Extra Bessemer to Wakefield

After this order was issued it became necessary for engine 3004 to return to Siemens to haul empty ore cars from Siemens to Wakefield, and the crew received a copy of train order No. 232, Form 19, which was completed at 1:18 p. m., reading as follows:

Eng Soo 3004 run Extra Bessemer to Siemens.  
This order annulled at one fifty five 155 pm.

This train departed from Bessemer at 1:30 p. m., according to the train sheet, and arrived at Siemens at 1:40 p. m. At Siemens the crew received copies of train orders Nos. 235 and 236. Order No. 235, Form 31, which was made complete at 1:50 p. m., read as follows:

Order No. 230 is annulled.

Order No. 236, Form 19, which was made complete at 1:52 p. m., read as follows:

After Extra 2161 West arrives at Siemens  
Eng Soo 3004 run Extra Siemens to Wakefield.

This train departed from Siemens at 2:05 p. m., with 97 empty cars and a caboose, and, while moving at a speed estimated to have been between 10 and 15 miles per hour, collided with the front portion of Extra 2419 West.

Both engines and tenders were derailed and badly damaged but remained practically upright. The first two cars of Extra 2419 were derailed and overturned to the south of the track and were badly damaged; the next six cars were derailed and badly damaged but remained practically upright. The first three cars of Extra 3004 were derailed to the south of the track and were demolished.

The employee killed was the conductor of Extra 2419. The employees injured were the engineman and the fireman of Extra 2419, and the engineman, the fireman and the front brakeman of Extra 3004.

### Summary of Evidence

Engineman Schwartz, of Extra 2419, stated that when leaving Wakefield his train consisted of 50 or 52 loaded cars and en route to Bessemer 26 or 29 loaded cars were added. At Bessemer Soo engine 3004 was coupled ahead of engine 2419 and 52 cars were hauled to Siemens. As the flagman had been left at Bessemer both engines proceeded from Siemens to Bessemer under flag protection. Engine 3004 left Siemens first and engine 2419 followed at a distance of 10 or 15 car lengths until they reached Bessemer. Since they were working within yard limits which extended 2,449 feet east of Siemens he did not think strict compliance with the 10-minute spacing rule was necessary. He had been disregarding the spacing rule in this vicinity for some time and had never been criticized. Arriving at Bessemer he left his engine on the main track, and he and the other members of his crew separated to eat their lunches; however, before leaving the conductor told the engineman that engine 3004 was to proceed to Wakefield. During a period of about 30 minutes the engineman was unable to see movements of trains. Immediately after the lunch period engine 2419 was backed into the yard and coupled to 26 loaded cars and then it proceeded toward the station. The train-order signal was displayed at the station. The engine was nearly stopped when the operator handed his crew two copies of a train order authorizing engine 2419 to run extra Bessemer to Siemens after Extra 3004 East arrived at Bessemer. He asked his conductor where Extra 3004 was and the conductor replied that Extra 3004 had already arrived at Bessemer and at that time was at Wakefield. Extra 2419 proceeded toward Siemens and when the engine was about 1-1/4 miles west of Bessemer station the engineman saw Extra 3004 approaching at a distance of approximately 300 feet; his engine was working steam and was moving at a speed of about 25 miles per hour. He immediately applied the air brakes in emergency and then jumped off. He did not know that engine 3004 had gone to Siemens instead of to Wakefield. Since he did not question the information given by the conductor that Extra 3004 had arrived at Bessemer he did not ask for a train-order register check as he usually does when he fails to see trains arrive. He said that he understood the yard-limit rule, and that if engine 3004 had been standing instead of moving at the point where he first saw it he could have stopped his engine short of that point. He said that if the yard-limit rule were strictly complied with at this location a west-bound engine hauling 26 loaded cars would stall on the grade. The weather was clear at the time of the accident.

Fireman Zamorovitz, of Extra 2419, stated that his conductor was on the engine when it left Bessemer on the second trip to Siemens. Both copies of train order No. 238 were received on the engine. He read the order with the conductor, who remarked that Extra 3004 had arrived at Bessemer and had departed for Wakefield. The fireman heard the engineman ask the conductor



about Extra 3004 and the conductor's reply was the same as his remark to the fireman. When his engine was approaching the point of accident and was moving at a speed of about 15 miles per hour the fireman was tending the fire and the conductor was on the left seat-box. The fireman did not know of anything being wrong until the engineman applied the brakes in emergency.

Brakeman Basket, of Extra 2419, stated that when engine 2419 made the first trip from Bessemer to Siemens with engine 3004 coupled ahead he remained at Bessemer to provide flag protection for both engines to return. When engine 3004 returned from Siemens he talked with the conductor in charge of that engine and was told that engine 3004 had been instructed to go to Siemens and then to return to Bessemer. He said that when engine 3004 left Bessemer to go to Siemens the other members of the crew of Extra 2419 were eating. He did not say anything to the other members of his crew concerning engine 3004 departing for Siemens instead of to Wakefield. When engine 2419 departed for Siemens with 26 cars he was stationed on the rear car and he did not see train order No. 238 until after the accident occurred. He said that his engine was moving 20 or 25 miles per hour at the time of the collision.

Brakeman Lang, of Extra 2419, stated that he remained at Bessemer to provide flag protection in order that engine 2419 could return to Bessemer after it delivered 26 cars to Siemens. He did not see engine 3004 depart for Siemens nor did he see train order No. 238 which his crew received at Bessemer.

Engineman Paull, of Extra 3004, stated that his conductor remained at Bessemer to provide flag protection so that his engine could return to Bessemer after it assisted engine 2419 to Siemens. After engine 3004 arrived at Siemens it was turned and then it departed for Bessemer. He said that he did not get a clearance from the operator at Siemens because no east-bound train had passed within 10 minutes prior to the departure of his engine from Siemens. He did not know how the operator at Siemens governed 10-minute spacing when crews returning to Bessemer did not call him for a clearance. At Bessemer the crew of engine 3004 was instructed to go to Siemens with the caboose and to pick up a train of empty cars for Wakefield. Before this train departed from Siemens an air-brake test was made and the brakes functioned properly. After order No. 236 was received he registered orally with Extra 2161 and then his train departed from Siemens. He said that if he had not seen Extra 2161 he would not have permitted his train to depart from Siemens unless he was given a register check of the arrival of Extra 2161. When his train was approaching the point of accident the throttle was closed and the speed was about 15 miles per hour. The fireman and the brakeman both called a warning to stop. He immediately applied the brakes in emergency and opened the sander valve, but too late to avert the accident. He understood the

yard-limit rule and thought he was complying with it. He thought he could have stopped his train in a distance of two car lengths.

Fireman Kerr, of Extra 3004, corroborated the statement of his engineman. He stated that he was familiar with the yard-limit rule and thought his engineman was complying with it. Engine 2419 was about 400 feet distant when he called a warning to the engineman. The fireman thought his train could have been stopped in that distance. He said the accident would not have occurred if engine 2419 had not been moving toward Extra 3004.

Brakeman Taylor, of Extra 3004, stated that he was on the left seat-box of the engine between Siemens and the point of accident. He corroborated the statement of the fireman.

Conductor Drengler, of Extra 3004, stated that after engine 3004 assisted engine 2419 to Siemens it returned to Bessemer to comply with the provisions of order No. 230 to run extra Bessemer to Wakefield; however, engine 3004 ran extra to Siemens instead, and his crew received annulment of order No. 230 at Siemens. After 97 empty cars were picked up at Siemens, order No. 232 was received; then, after the arrival of Extra 2161 West, Extra 3004 departed. When his train was about 1-1/2 miles east of Siemens and while it was moving at a speed of 10 or 12 miles per hour it collided with Extra 2419. He said the accident occurred at 2:15 p. m.

Brakeman Sinclair, of Extra 3004, corroborated the statement of his conductor.

Operator Windel, on duty at Bessemer between 2 p. m. and 10 p. m. on the day of the accident, stated that train order No. 238 was received by the first-trick operator and was properly transferred to him at 2 p. m. The first-trick operator did not inform him of the location of Extra 3004. When engine 2419 passed the station on the main track he delivered copies of the order to both the engineman and the conductor who were on the engine. He had checked the station record and noted that Extra 3004 East had arrived at Bessemer at 12:15 p. m. but he did not observe that engine 3004 had departed westward to Siemens at a later time. He did not know at the time he delivered the order whether Extra 3004 East had arrived or whether engine 2419 would wait at the west switch of the siding for Extra 3004 East to take siding.

Operator Johnson, on duty at Bessemer from 6 a. m. until 2 p. m., on the day of the accident, stated that he copied train order No. 238 addressed to engine 2419 and the operator at Bessemer. The order was properly transferred to the relieving operator at 2 p. m. He said that both he and the second-trick operator understood that Extra 3004 was at Siemens. He said that

a train order directing engine 3004 to run extra to Wakefield had been issued but the yardmaster had changed the plans and engine 3004 ran extra from Bessemer to Siemens instead. He copied this running order and reported engine 3004 as departing west-bound from Bessemer to Siemens at 1:30 p. m.; also, he made a notation on the station record that Extra 3004 departed at 1:30 p. m. He stated that if he had handled the delivery of train order No. 238 he would not have permitted engine 2419 to depart until after Extra 3004 East arrived.

Yardmaster Sampson, on duty at Ironwood, stated that the district between Wakefield and Siemens was under his supervision. He does not confer with the train dispatcher but gives instructions to train conductors who in turn notify the train dispatcher of the orders needed. He notified the conductor of engine 2419 that engine 3004 would assist engine 2419 for several trips between Bessemer and Siemens and issued instructions to the conductor of engine 3004 for that engine to assist engine 2419 on two trips between Bessemer and Siemens. Learning that the mines in the vicinity of Wakefield were running short of empty cars he instructed the operator at Siemens to notify the conductor of engine 3004 to discontinue helping engine 2419 and to pick up 97 empty cars for delivery at Wakefield; however, the operator at Siemens was unable to deliver the instructions before engine 3004 returned to Bessemer.

Train Dispatcher Bessey stated that he was on duty at Antigo between 6 a. m. and 2 p. m. on the day of the accident. The information he had was that engine 3004 would assist engine 2419 one trip from Bessemer to Siemens then would proceed to Wakefield. He sent train order No. 230 to the operator at Bessemer at 12:52 p. m. At 1:25 p. m. the operator at Bessemer reported engine 3004 ready to proceed from Bessemer to Siemens to get a train of empty cars for Wakefield. He issued order No. 232 for the movement. Engine 3004 arrived at Siemens at 1:40 p. m., and, at 1:45 p. m., the operator at Siemens reported it ready to depart for Wakefield. He then issued train order No. 236. He annulled order No. 230 by order No. 235, Form 51, addressed to engine 3004 at Siemens. At 1:54 p. m. the operator at Bessemer reported engine 2419 ready to depart for Siemens; therefore, he addressed train order No. 238 to engine 2419 and to the operator at Bessemer. He then made a transfer to the second-trick dispatcher, who was going on duty at 2 p. m. Dispatcher Bessey said that as order No. 238 was addressed to the operator, in his opinion, the operator should have had an understanding with the crew of engine 2419 that their train would not leave until after Extra 3004 had arrived. He stated that trains doubling on the grade between Bessemer and Siemens make more than one movement between these points on one running order as the markers are not displayed until the final movement is being made; the return trip each time is made under flag protection at Bessemer. These movements are recorded on his

train sheet as one movement regardless of the number of trips. He said that when train order No. 238 was being issued it might have been an additional precaution to designate a time after which Extra 3004 was to arrive at Bessemer but that it is customary to do this at register stations only, and Bessemer was not a register station. He said that when engines are returning from Siemens to Bessemer under flag protection he is out of touch with them and has no knowledge whether crews comply with the 10-minute spacing rule.

Train Dispatcher Christensen stated that he was on duty at Antigo between 2 p. m. and 10 p. m. on the day of the accident. The train orders involved had been issued by the first-trick dispatcher. He said that it is customary for trains doubling on the grade between Bessemer and Siemens to make more than one movement on one running order; markers are not displayed and operators do not report these trains by until the final movement is being made. Return movements from Siemens to Bessemer are made under flag protection at Bessemer, and, as the times of these movements are not recorded on the train sheet, he had no knowledge whether the crews comply with the 10-minute spacing rule. He said that a running order is not fulfilled until the markers are displayed at the final limits of the order. He stated that, in his opinion, order No. 238 being addressed to the operator was a matter of information to the operator. He thought that it would have been an extra precaution for the operator at Bessemer to call the attention of the crew of engine 2419 to the fact that they were to wait at Bessemer for Extra 3004 East.

Trainmaster Garvey stated that, in his opinion, both trains had complied with the yard-limit rule; he thought the rule could have been complied with without Extra 2419 stalling on the grade. He considered the provisions of the present yard-limit rule were adequate. The collision was a result of two trains moving in opposite directions, closing in on each other, and being unable to stop in time to avert the collision. He had never observed whether crews complied with the 10-minute spacing-rule at Siemens. He said that the rule was violated if engine 2419 followed engine 3004 between Siemens and Bessemer with only a short space intervening. He thought that train order No. 238 was issued according to rule and that it contained all essential information. The practice of addressing orders to both a train and an operator resulted from oral instructions given by a transportation inspector 20 or 25 years previous. It was his opinion that the operator at Bessemer should not have delivered train order No. 238 to engine 2419 until after Extra 3004 had arrived, or until the crew of engine 2419 knew that they were to wait for Extra 3004. He thought the operator was misled by thinking that the crew of Extra 2419 knew about Extra 3004 and that the crew of engine 2419 intended to stop near the west switch of the siding to wait for Extra 3004; this was not an

unusual occurrence. He did not know of any change that could be made in the operating rules to prevent an accident such as this.

Superintendent Leppla stated that Rule S-203b did not apply in this case as Extra 2419 was created by the train order issued and that it was unnecessary to issue the order on a "31" form.

According to the train sheet, No. 52 departed from Siemens at 1:08 p. m. and arrived at Bessemer at 1:15 p. m. on the day of the accident.

During the 30-day period preceding the day of the accident, except Sundays and holidays, the average daily train movement between Bessemer and Siemens was 9.9 trains east and 9.2 trains west, and an average of 5 doubles per day.

#### Observations of the Commission's Inspectors

The Commission's inspectors observed that the view as the point of collision is approached from either direction is restricted to a distance of about 325 feet.

#### Discussion

According to the evidence, Extra 2419 West upon arrival at Bessemer consisted of a locomotive, 80 loaded cars and a caboose; because of the ascending grade between Bessemer and Siemens, the first 52 cars were detached and with Soo engine 3004, which had been on route east-bound, coupled on ahead, these 52 cars were moved to Siemens; then both engines returned to Bessemer. After returning to Bessemer Soo engine 3004, instead of continuing its eastward movement which had been interrupted by helping the forward portion of Extra 2419 from Bessemer to Siemens, was sent back to Siemens for the purpose of hauling empty ore cars eastward, and had started this eastward movement when the accident occurred. Train order No. 227 authorizing engine 2419 to run extra Bessemer to Siemens was annulled at 1:10 p. m., which was prior to the time the crew was ready to move the rear portion of Extra 2419 from Bessemer; order No. 238 was issued to authorize engine 2419 to run extra from Bessemer to Siemens after Extra Soo 3004 East arrived at Bessemer.

Train order No. 238 was addressed to the conductor and the engineman of engine 2419 and to the operator at Bessemer. During the investigation efforts were made to ascertain the purpose of addressing this order to the operator. According to the dispatcher who issued the order, the operator should have had an understanding with the crew of Extra 2419 that their train would not leave until after Extra 3004 had arrived; the dispatcher who

was on duty at the time of the accident thought the order was addressed to the operator as a matter of information only; the operator who received the order said that if he had delivered it to the crew he would not have permitted engine 2419 to depart until after Extra 3004 arrived, and the operator who delivered the order assumed either that Extra 3004 had arrived or that Extra 2419 would wait at the west switch, and apparently understood that he had no duty or responsibility in the matter other than to deliver the order to the conductor and the engineman of engine 2419. The operator who delivered the order was in position to obtain definite information concerning the location of Extra 3004, and the conductor and the engineman of Extra 2419 could have obtained this information from the operator before starting on the trip from Bessemer to Siemens. However, the investigation clearly disclosed there was no uniform understanding as to what was required under the circumstances.

When this order was delivered, the conductor, the engineman, and the fireman were on the engine and one brakeman was on the rear car; the other brakeman remained at Bessemer to provide flag protection for the return of his engine from Siemens. The brakeman on the rear car was the only member of this crew who knew that Extra 3004 had departed for Siemens instead of Wakefield, but he did not see train order No. 238 prior to the accident. Observing that the order was made complete at 1:56 p.m., the engineman was doubtful about the arrival of Extra 3004 at Bessemer, but according to the record the conductor told him that this train had already arrived at Bessemer and had gone to Wakefield; it appears that the conductor was relying on his knowledge of the arrival of Extra 3004 at 12:15 p. m., but as he was killed in the accident this could not be definitely determined.

The collision occurred within yard limits at Bessemer. The distance between Bessemer and Siemens was 2.5 miles, and the distance from the west yard-limit sign at Bessemer to the east yard-limit sign at Siemens was only 2,931 feet, within which distance running orders were required. The yard-limit rule of this railroad provides that trains and engines may use the main track within yard limits, protecting against first-class trains, and must move within yard limits expecting to find the main track occupied and must be prepared to stop unless the main track is seen or known to be clear. Members of the crews of both trains involved stated that they understood the yard-limit rule and that they thought they were complying with this rule. The enginemen of each train said that if the opposing train had been standing at the point where he first saw it he could have stopped his train short of that point; however, as the crew of each engine could first see the opposing train when the engines were only 325 feet apart, and, as the speed of one train was estimated at 15 to 25 miles per hour and the other at 10 to 15 miles per hour at the time of the accident, it does not appear that either train could have been stopped short of the point at which the other train

was first seen. The engineman of Extra 2419 West said that if he had complied strictly with the yard-limit rule his train would have stalled on the ascending grade. That the yard-limit rule is recognized as being in force is shown by the record; one engineman stated he did not provide an interval of 10 minutes between his engine and the preceding engine when leaving Siemens because both engines were within yard limits and in that case he did not think strict compliance with the spacing rule was necessary. Notwithstanding that a head-end collision occurred, the trainmaster thought the crews of both trains were complying with the yard-limit rule and that the yard-limit rule was adequate. However, as the collision occurred it is obvious that either the yard-limit rule was not obeyed or it was not adequate. Apparently the employees did not have a thorough understanding of the yard-limit rule and the supervisory officials had not instructed them properly and had not enforced the rule.

This investigation disclosed lax practices not only in the operation of trains within yard limits but also in the observance of other rules not directly involved in this accident.

#### Conclusion

This accident was caused by failure of the crew of Extra 2419 to obtain definite information concerning arrival of the opposing extra named in its running order and by failure to operate both trains involved under proper control within yard limits.

Respectfully submitted,

S. N. MILLS,

Director.