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# Railroad Accident Investigation Report

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Report No. 79-8  
**MISSOURI PACIFIC RAILROAD COMPANY**  
**HECLA, KANSAS**  
**OCTOBER 5, 1978**



**U.S. DEPARTMENT OF TRANSPORTATION**  
**FEDERAL RAILROAD ADMINISTRATION**  
**Office of Safety**

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RAILROAD ACCIDENT INVESTIGATION

REPORT, NO. 79-8

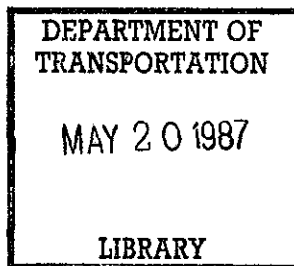
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MISSOURI PACIFIC RAILROAD COMPANY

HECLA, KANSAS

OCTOBER 5, 1978



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FEDERAL RAILROAD ADMINISTRATION,

OFFICE OF SAFETY,

WASHINGTON, D. C. 20590

FEDERAL RAILROAD ADMINISTRATION  
OFFICE OF SAFETY

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RAILROAD ACCIDENT INVESTIGATION  
ACCIDENT REPORT NO. 79-8

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MISSOURI PACIFIC RAILROAD COMPANY  
HECLA, KANSAS  
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Synopsis

On October 5, 1978, at 4:08 a.m., a side collision occurred between two Missouri Pacific Railroad freight trains at Hecla, Kansas. At the time of the accident, the weather was clear.

Cause

The collision was caused by the failure of the engineer of the southbound train to operate that train in accordance with signal indications. A contributing factor to the accident was the failure of the front brakeman of that same train to take positive action to stop the train in accordance with the signal indications after the engineer had failed to do so.

Casualties

The engineer and the front brakeman of the southbound train sustained strains and bruises when the lead locomotive unit of that train derailed and overturned. The flagman in the caboose suffered strains and bruises when he lost his equilibrium as a result of the sudden stop caused by the collision. There were no injuries to the crew of the northbound train.

### Location and Method of Operation

The accident occurred on the Missouri Pacific Railroad, Central Division, Coffeyville Subdivision, which extends from Osawatomie, Kansas to Coffeyville, Kansas, a distance of 133.4 miles. Trains operate in the accident area by signal indications of a traffic control system which governs movements in either direction over a single main track. A siding, 8,042 feet in length, parallels the main track to the west at Hecla, Kansas, 19 miles south of Osawatomie. The collision occurred at the clearance point of the Hecla siding's south turnout, 215 feet north of the south siding switch.

### Track

From the north on the main track there are, successively, a tangent for 4,335 feet, a 2° curve to the left for 619 feet, and a tangent for 3,648 feet to the point of collision. In this area, the average grade for southbound trains is 0.27% ascending.

### Authorized Train Speed

The maximum authorized speed for freight trains in the accident area is 50 m.p.h.

### Signals

Signals 3491, 705S and 706S govern southbound movements on the main track at Hecla. They are, respectively, 24,979, 7,842 and 115 feet north of the point of collision. Signal 706N governs northbound movements proceeding on the main track and entering the Hecla siding. This signal is located 229 feet south of the collision point. The signals are of the color-light type, continuously lighted.

The signals, applicable aspects, corresponding indications and names are:

<u>Signal</u>	<u>Aspect</u>	<u>Name</u>	<u>Indication</u>
3491	Flashing yellow	Approach Medium	Proceed, reducing to 35 mph before reaching next signal
705S	Yellow-Over-Red	Approach	Proceed, immediately reducing to 40 mph or slower if necessary, prepared to stop before reaching next signal
706S	Red	Stop	Stop
706N	Red-Over-Lunar	Low	Proceed at low speed

The train dispatcher at Kansas City, Missouri controls signals 705S, 706S, 706N and both Hecla siding switches from the traffic control machine. Signal 3491 is automatic. The circuits are so arranged that with the south siding switch lined for the movement of a northbound train from the main track into the siding, and with the north siding switch lined for the movement of a southbound train on the main track, the signals display the following aspects for a northbound train; signal 706N displays a Red-Over-Lunar (Low) aspect; for a southbound train, signal 3491 displays a Flashing Yellow (Approach Medium) aspect, signal 705S displays a Yellow-Over-Red (Approach) and signal 706S displays a Red (Stop) aspect.

#### Sight Distance

The view of signal 706S for a southbound train and signal 706N for a northbound train are both unobstructed for more than 3,000 feet. The view of all signals in the accident area exceeds 2,000 feet.

## Applicable Rules

### Definitions

**Low Speed:** A speed that will permit stopping short of train, engine, obstruction, or switch not properly lined and looking out for broken rail, but not exceeding 20 mph. (Uniform Code of Operating Rules)

### 107 Co-operation Between Crew Members

. . .

(6) When the conductor or engineer fails to take action to stop the train, and an emergency requires, other members of crew must take immediate action to stop the train. (Uniform Code of Operating Rules)

327 Where Stop Must Be Made. A train or engine must stop before any part of the train or engine passes a Stop, or Stop, Then Proceed at Low Speed indication. If a train or engine overruns a Stop, or Stop, Then Proceed at Low Speed indication, the fact must be reported to the train dispatcher. (Uniform Code of Operating Rules)

400 Movement by Signal Indication. Within defined limits on designated tracks, so specified on the timetable, or by special instructions, the movement of trains and engines will be governed by block signals whose indication will supersede the superiority of trains for both opposing and following movements on the same track, but do not supersede train orders... (Uniform Code of Operating Rules)

### Special Instructions

(7) Rule 34 and 34(a): Employees located in the operating compartment of an engine must communicate to each other in an audible and clear manner the name of each signal affecting movement of their train or engine, as soon as the signal is clearly visible. It is the responsibility of the engineer to have each employee comply with these requirements, including himself.

It is the engineer's responsibility to have each employee located in the operating compartment maintain a vigilant lookout for signals and conditions along the track which affect the movement of the engine or train.

If a crew member becomes aware that the engineer has become incapacitated or should the engineer fail to operate or control the engine or train in accordance with the signal indications or other conditions requiring speed to be reduced, other members of the crew must communicate with the crew members controlling the movement at once and if he fails to properly control the speed of the train or engine, other members of the crew must take action necessary to insure the safety of the train or engine, including operating the emergency valve.  
(Missouri Pacific Railroad Special Instructions)

### Circumstances Prior to the Accident

#### Extra 2289 North

After having completed the statutory off-duty period, the crew of Extra 2289 North went on duty at Coffeyville, Kansas at 8:30 p.m., October 4, 1978. At 9:40 p.m., Extra 2289 North, consisting of six locomotive units, 111 cars and a caboose left Coffeyville. Signal 706N at Hecla displayed a Red-Over-Lunar (Low) aspect, and the engineer reduced the speed of the train to 10 mph before entering the siding. The engineer and the front brakeman were in the control compartment of the lead locomotive unit. This unit was positioned with the front, or short hood, to the north, placing the engineer on the right, or east side of the locomotive. The conductor and the flagman were in the caboose.

#### Extra 2080 South

After having completed the statutory off-duty period, the crew of Extra 2080 South went on duty at Osawatomie, Kansas at 3:05 a.m., October 5, 1978. The engineer had received the three-unit locomotive consist, Nos. 2080, 623 and 2553, in that order, coupled to the train on the main track at the Osawatomie Yard office. The previous inbound engineer had stopped the lead locomotive unit at a watering facility to replenish low coolant water that had automatically caused the unit to stop running at Bucyrus, Kansas, 23 miles from Osawatomie. After supplying the unit with water, the unit was started but the low water shutdown feature continued to activate when operating in other than the idle throttle position. The outbound engineer, in conversation with the inbound engineer, was informed of one instance of other than a normal running air brake application and release that had occurred just prior to arrival at Osawatomie. The outbound engineer was also advised to make a brake test at the first opportunity.

At 3:15 a.m., Extra 2080 South, consisting of three locomotive units, 75 cars and a caboose, left Osawatomie. The lead locomotive unit, No. 2080, was idling (off line) without tractive power. A train air brake test was neither required nor performed. The conductor and the flagman made a roll-by inspection prior to departure, with no exception taken.

As Extra 2080 South approached Hecla, the engineer and the front brakeman were riding in the control compartment of the lead locomotive unit. This unit was positioned with the front, or short hood, to the south, with the engineer on the right or west side of the locomotive. The conductor and the flagman were in the caboose.

### The Accident

#### Extra 2289 North

Approaching Hecla, the speed of Extra 2289 North was reduced to comply with signal indication. This signal, 706N displayed a Red-Over-Lunar aspect. The engineer stopped the train prior to entering the siding to further reduce the brake pipe pressure sufficiently enough to insure an effective brake release after a minimum brake pipe reduction. The train entered the siding at a speed of 10 mph. The engineer and the front brakeman first saw the headlight of the southbound train when the lead unit of Extra 2289 North was approximately 2,500 feet into the siding. Both the engineer and the brakeman stated that the intensity of the southbound train's headlight was less than bright. Neither could testify after the accident as to whether the crew of Extra 2080 South had ever sounded the train horn or bell, or whether that train's air brakes had been applied.

#### Extra 2080 South

As Extra 2080 South approached Hecla, signal 3491 displayed a Flashing Yellow (Approach Medium) aspect. Signal 705S, at the north siding switch, displayed a Yellow-Over-Red (Approach) aspect. The engineer recalled having seen signal 706S at the south siding switch displaying a Red (Stop) aspect from a distance. He could not, however, remember observing the red signal at any time after meeting and passing the northbound train's locomotive units near a road crossing about mid point of the siding.



The engineer stated that from the time he passed the locomotive units of Extra 2289 North until some time later in the hospital, his memory was totally blank.

According to the front brakeman, the only signal that he both observed and understood the meaning of was the Red (Stop) aspect of signal 706S at the south siding switch. Unable to identify from what location he observed the headlight of the northbound train, and being unfamiliar with the physical characteristics of the track, the front brakeman supposed that both trains were operating on the same track. His concern caused him to call out to the engineer in alarm. The engineer made no response. At the same time, the front brakeman became aware of the southbound train's movement on the siding. Minutes after meeting and passing the locomotive units of Extra 2289 North, he observed the Red aspect of signal 706S and recognized the danger. Again, he called out in warning to the engineer, who again did not respond. The front brakeman then realized that it was too late to prevent a collision, and dropped to the floor of the locomotive cab.

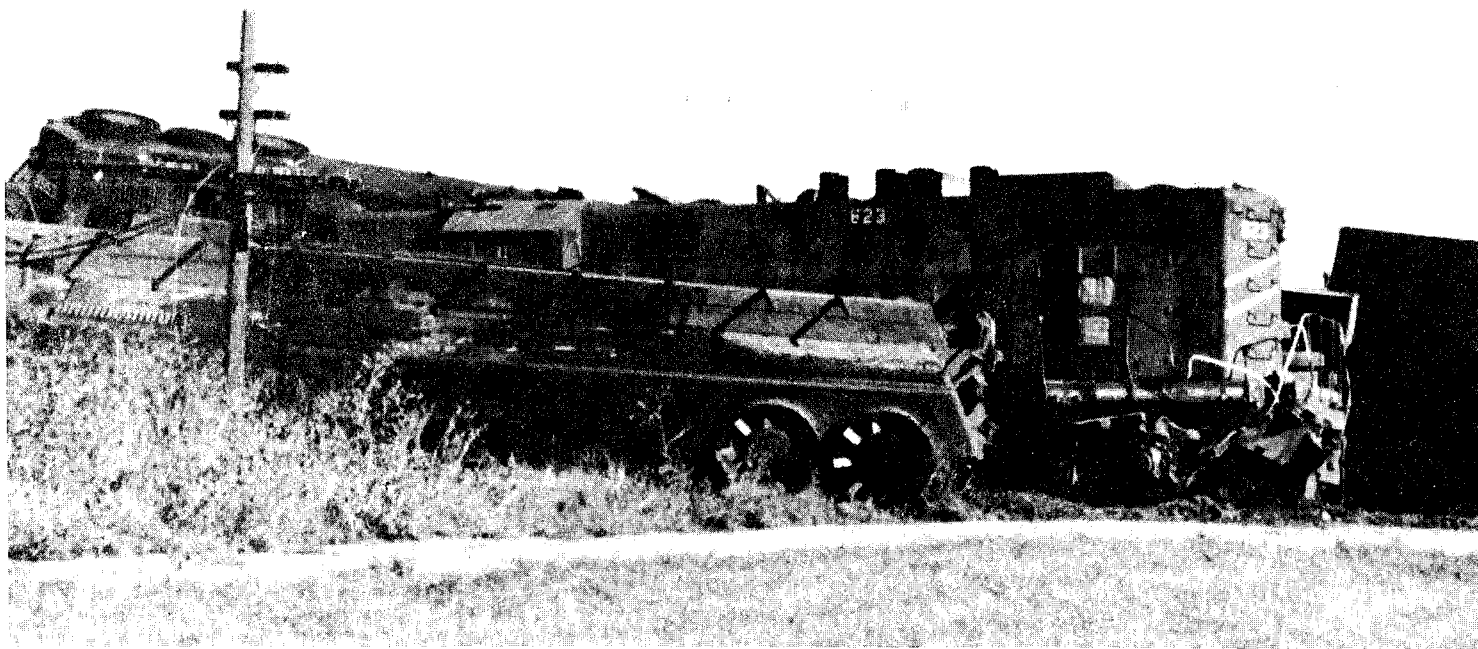
The lead locomotive unit of Extra 2080 South then struck the northbound train's 58th car from the locomotive consist.

The speed recorder on the lead locomotive unit of Extra 2080 South indicated that the speed of the train for a distance of three miles approaching the point of collision, and at the collision point, was a constant 30 mph.

### Damages

#### Extra 2289 North

The locomotive units and the first 57 cars were moving into the siding when the collision occurred. The collision derailed the 58th through 61st cars. The 58th, 59th and 60th cars overturned to the west, and came to rest in various positions off the track structure near the point of collision, and were destroyed. The 61st car remained upright, derailed to the west, and stopped partially on the track structure. The car was substantially damaged.



### View of Collision

Locomotive Unit 623 (Upright) is the second locomotive unit in the consist of Extra 2080 South.

### Extra 2080 South

In the collision, the lead locomotive unit of Extra 2080 South, No. 2080, was derailed and turned at a 75° angle to the east of the main track, coming to rest on its left side with the front, or south end on the main track structure, 190 feet south of the collision point. The second unit (No. 623) derailed remained upright turned at a 90° angle to the main track, and was propelled eastward coming to rest on the right-of-way, 15 feet from the main track structure and 160 feet south of the collision point. The third unit (No. 2553) derailed remained upright slightly canted to the east, and turned at a 75° angle to the east of the main track, coming to rest with the rear, or south end on the track structure, 160 feet south of the collision point. All three units were substantially damaged.

The first five cars derailed, and the first four cars overturned. The first and fourth cars came to rest, turned at a 75° angle to the east of the main track. The second car came to rest with the south end derailed to the west and the north end derailed to the east, across both tracks. The third car was stopped at a 10° angle to the main track. The south end of the fifth car derailed to the east, the north end remaining on the track structure. Three of the derailed cars were destroyed and two were substantially damaged.

Total damage cost to equipment, track and signals was \$147,000.

### Post Accident Investigation and Tests

#### Extra 2080 South

Unit 2080 is an Electro-Motive Division (EMD) GP-38-2 road switcher type locomotive, equipped with 26L air brake equipment with a gross weight of 266,420 pounds. Unit 623 is an EMD GP-7 road switcher type locomotive, equipped with 24 RL air brake equipment with a gross weight of 244,725 pounds. Unit 2553 is an EMD GP-35 road switcher type locomotive, equipped with 26L air brake equipment with a gross weight of 258,740 pounds.

Post-accident investigation disclosed the positions of the operating and air brake controls of Unit 2080. The automatic brake valve was in release position, the independent brake valve was in the release position, the throttle was in the No. 8 position, and the reverse lever was in the forward position. The fireman's emergency brake valve was in the normal, or closed, position. The position of the isolation switch indicated that the unit was idling, not producing tractive effort, and the appurtenances applicable to multiple-unit-control were properly aligned for such operation. Testing of the three locomotive units, coupled in multiple-unit-control, duplicating conditions present at the time of the accident, indicated that the air brake equipment and the control mechanisms were in effective operating condition.

The air brakes on the remaining undamaged cars of Extra 2080 South were tested and found to be in effective operating condition.

Immediately after the accident, investigators tested the signal system and found nothing to indicate that the system had malfunctioned.

#### Engineer and Front Brakemen of Extra 2080 South

At the time of the accident, the engineer, age 30, had eight years of service, five of them as an engineer with the Missouri Pacific Railroad. He was last examined on the operating rules in March 1976, and successfully passed a physical examination in September 1973, on his promotion to engineer.

The front brakeman, age 21, had been in service five weeks, during which he received yard service, on-the-ground training and attended a five-day training school for which he qualified for duty as a yard switchman and road brakeman. The road trip, the day of the accident, was the first duty that he had ever performed as a road brakeman. This was also the first time that he had been over this territory, and the first time that he had been in the control compartment of a road type locomotive. He was last examined on the operating rules as a part of his formal classroom training. He successfully passed a physical examination in qualifying for employment.

### Analysis

There are a number of discrepancies in the statements of the engineer and the front brakeman of Extra 2080 South. The front brakeman stated that between Osawatomie, the originating terminal, and Hecla, the accident point, a distance of 19 miles, the engineer left the control compartment on two occasions and went out on the locomotive walkway. The engineer was unable to recall having left the control compartment.

Another discrepancy concerns the calling of signal aspects. The engineer stated that he called the first signal after leaving Osawatomie, but could not remember whether he did or did not call any other signals, including the signals at Hecla. The front brakeman stated that the engineer did not call the first signal, nor any other signal. The front brakeman also indicated that because of the idling locomotive unit, the control compartment was relatively quiet, and he would have been able to hear the engineer call the signals.

The engineer stated that he made three separate train brake applications in the vicinity of Hecla. The front brakeman, the conductor and the flagman of Extra 2080 South could not recall any brake application. Neither the engineer nor the front brakeman of Extra 2289 North could recall having observed indications that the train brakes of Extra 2080 South had been applied prior to or at the time that the lead locomotive units of the two trains met and passed. Both the automatic and independent brake handles were in release position when examined after the accident.

The front brakeman of Extra 2080 South further stated that on two occasions, near the north siding switch and just before the collision, he called out in a loud voice to the engineer. Because of the totally dark control compartment, he did not observe any movement or other response. In addition, although he was aware of the emergency brake valve, he stated that he would have been unable to locate the valve in the darkness.

The discrepancies in the statements made by both the engineer and the front brakeman suggest that the engineer was not alert to the conditions affecting the movement of the train.

Findings

1. At the time of the collision, Extra 2289 North was being operated in accordance with carrier operating rules and signal indications.

2. The engineer and the front brakeman of Extra 2080 South had not been calling signal indications to each other, as required by carrier operating rules.

3. After passing Signal 705S, which displayed a Yellow-Over-Red (Approach) aspect, the engineer of Extra 2080 South took no action to prepare the train for a stop before reaching the next signal.

4. The front brakeman, when verbal communication was ineffectual, took no action to require the engineer to slow the speed of the train as it passed Signal 705S and approached the next block. The front brakeman was unfamiliar with the train operations, signal indications, and the territory involved.

Dated at Washington, D. C., this 15th  
day of November 1979  
By the Federal Railroad Administration

J. W. Walsh  
Chairman  
Railroad Safety Board