

INTERSTATE COMMERCE COMMISSION

WASHINGTON

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REPORT NO. 3576

CHICAGO, MILWAUKEE, ST PAUL & PACIFIC RAILROAD COMPANY

IN RE ACCIDENT

AT AVERY, IDAHO, ON

MAY 28, 1954

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SUMMARY

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Date: May 28, 1954

Railroad: Chicago, Milwaukee, St. Paul & Pacific

Location: Avery, Idaho

Kind of accident: Electrocution

Train involved: -

Train number: -

Locomotive unit number: E-11

Consist: Light locomotive unit

Speed: Standing

Operation: Ready for passenger train service

Track: On enginehouse ready track

Time: 2:30 a.m.

Casualties: 1 killed

Cause: Contact with an electrically energized part of locomotive

INTERSTATE COMMERCE COMMISSION

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REPORT NO. 3576

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION  
REPORTS UNDER THE LOCOMOTIVE INSPECTION ACT  
OF FEBRUARY 17, 1911, AS AMENDED

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CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC RAILROAD

July 15, 1954

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Accident at Avery, Idaho, on May 28, 1954, caused by contact  
with an electrically energized part of an electric loco-  
motive unit

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REPORT OF THE COMMISSION<sup>1</sup>

CLARKE, Commissioner

On May 28, 1954, about 2:30 a.m., at Avery, Idaho, while Chicago, Milwaukee, St. Paul & Pacific Railroad electric locomotive unit E-11 was standing on an enginehouse ready track, the working foreman contacted an electrically energized part of the unit. He was pronounced dead 2½ hours later.

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<sup>1</sup>Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Clarke for consideration and disposition.

## DESCRIPTION OF ACCIDENT

Chicago, Milwaukee, St. Paul & Pacific Railroad electric locomotive unit E-11 had been made ready for service on east-bound passenger train No. 16 due to depart from Avery, Idaho, at 3:05 a.m., May 28, 1954. The hostler had placed the unit on a shop track outside of the roundhouse with the No. 2 or east pantograph up, motor-generator set and compressor running, aisle and cab lights on, and headlight off. This was reported to the working foreman on duty. When locomotive E-11 had arrived at 11:05 p.m., May 27, 1954, the engineer had reported the horn gap fuse blown. The working foreman had renewed the blown fuse prior to the time the locomotive was set out for service.

The fireman called for train No. 16 arrived at the roundhouse register room at about 2:20 a.m. where he met the hostler and a few moments later they were joined by the working foreman. In response to a question by the fireman as to the condition of the unit, the working foreman stated the inbound crew had reported trouble with the auxiliary fuse blowing and mentioned that the locomotive was equipped with a new type of auxiliary fuse holder. The fireman wanted to see the fuse holder, and the three men proceeded together to the front cab of the unit where the hostler remained while the others continued through the unit to the rear platform. The working foreman then ascended a ladder to a 13½ x 36 inch platform, located near the center of the cab face and 38 inches below the roof, which placed him close to the electrically energized fuse holder. The fireman, who was standing below, heard the working foreman comment that the fuse holder even had fancy brass, then heard an ejaculation and looked up to see the foreman fall forward, his hand resting on the brass knob on the right side of the fuse holder, and sparks shooting from his feet. The fireman immediately jumped to the ground, ran to the front cab, lowered the pantograph, and told the hostler that the foreman had come in contact with high voltage. They went to the rear of the unit and found the foreman crumpled on the platform. With assistance of a stationary fireman, the foreman was lowered to the ground and artificial resuscitation started. Subsequently the unconscious foreman was placed in the baggage car of train 16 and artificial resuscitation continued until arrival at Hogen, Mont., approximately two hours later, where a physician pronounced him dead at 5:00 a.m.

## DESCRIPTION OF LOCOMOTIVE

Electric locomotive unit E-11, type 2-3-1/1-C-2, carrier's class EP3, was built by Baldwin-Westinghouse at East Pittsburgh, Pa., December 1919. The 3,000 volt direct current electric power used was received from an overhead catenary which was fed by substations along the line. The unit was equipped with 2 two-shoe

pantographs, type S-131, which collected current from the catenary and fed it to 12 Westinghouse 348 traction motors through an electro-pneumatic system of controls. A motor-generator set furnished 85 volt direct current for lights, control circuits, air compressor, and excitation of the axle generators which excited the traction motor fields in regenerative braking. Weight of the locomotive in working order was 600,000 pounds, on driving wheels was 378,000 pounds, and on trucks was 222,000 pounds. Maximum tractive effort was 86,000 pounds.

#### DESCRIPTION OF PARTS INVOLVED

The horn gap fuse was in the 3,000 volt circuit between the pantograph and the motor-generator set. Any excessive current or line surge would blow the fuse and open the circuit, rendering the motor-generator set inoperative and necessitate use of axle generators to supply the control and battery charging circuits.

Each of two fuse holder brackets was supported on an insulator mounted on a wood plank 3 x 9 x 67½ inches in length. The plank had 2 insulators at each end which were bolted to the roof. The fuse holder brackets were 12½ inches from the edge of the roof. The 40 ampere aluminum 1/32-inch ribbon type fuse was 1 inch wide at the ends, 5½ inches in length and narrowed to 1/8 inch in width at the center. It was held in place in the brackets by wedge type blocks secured by screws having knurled handles about 3 inches in diameter.

Locomotive E-11 was the only electric passenger locomotive unit which had been equipped by the carrier with this type fuse holder. The holder had originally been installed on a freight unit and was transferred to unit E-11 in January, 1954.

#### EXAMINATION OF PARTS INVOLVED

Both horn gap fuse brackets, the right adjusting screw, and the left bracket insulator were blackened and showed evidence of contact. The handle of the right fuse holder adjusting screw still had small particles of flesh adhering to it.

All parts of the fuse assembly were examined and found to be in good working condition. The wood plank on which the fuse bracket insulators were mounted was found to have considerable vibratory spring at the fuse brackets. In service the vibration could cause fatigue failure of the fuse and, if in addition it was drawn taut between the bracket jaws, this tension would result in a shorter service life of the fuse

Two warning signs 7 x 10 inches were located at the rear of the locomotive and read "Keep Away DANGER High Voltage". One was on the roof above and to the left of the ladder and the other directly under the roof overhang between the platform and fuse brackets.

### INSPECTION AND REPAIR REPORTS

The last annual inspection was made January 15, 1954, and the last monthly inspection on May 13, 1954, both at Deer Lodge, Montana. Daily inspection and repair reports on file at Avery, Idaho, and Harlowton and Deer Lodge, Montana, enginehouses were examined for a period of sixty days prior to the accident and the following items relative to the auxiliary circuit and the blowing of horn gap fuses were found:

April 3, Avery, Idaho, engineer's report: "Auxiliary fuse blown". Item signed for and approved by foreman.

April 6, Deer Lodge, Mont., engineer's report: "Clean MG set coms and renew string bands". Item signed for and report approved by foreman.

April 11, Harlowton, Mont., engineer's report: "Auxiliary fuse blew three times please examine". Item signed for and report approved by foreman.

April 23, Deer Lodge, Mont., engineer's report: "Motor kicked out and blowed horn gap fuse". Item signed for and report approved by foreman.

April 29, Avery, Idaho, engineer's report: "Brushes arcing on MG set". Item signed for and report approved by foreman.

May 2, Avery, Idaho, engineer's report: "The commutator on MG set is arcing".  
Notation: "no time to stone".  
Report approved by the foreman.

May 3, Harlowton, Mont., engineer's report: "MG set arcing bad". Item signed and report approved by foreman.

May 4, Avery, Idaho, engineer's report: "MG set arcing badly". Item signed for and report approved by foreman.

May 23, Harlowton, Mont., engineer's report: "Horn gap fuse blown". Item signed for and report approved by foreman.

May 24, Deer Lodge, Mont., engineer's report: "Horn gap fuse blown". Item signed for and report approved by foreman.

May 27, 11:05 p.m., Avery, Idaho, engineer's report:  
"Put on a supply of horn gap fuses"  
"Horn gap fuse blown"  
"Horn gap vibrates excessively causing fuses to blow".  
Note: This report was made prior to the accident, and was not signed off by the deceased working foreman. Report approved by day foreman who was called in at the time of the accident.

### SUMMARY OF EVIDENCE

The engineer who handled locomotive E-11 between Three Forks and Deer Lodge, Montana, on the trip prior to the accident stated that the engineer he relieved told him that two fuses had been blown between Harlowton and Three Forks. A new fuse was applied at Three Forks and the trip to Deer Lodge was without incident.

The engineer from Deer Lodge to Avery, Idaho, stated that the locomotive operated normally for a distance of about 65 miles where it blew a horn gap fuse. As the fuse supply was depleted, the train proceeded 15 miles to Missoula, Montana, where the auxiliary device to operate from the axle generator was set up.

The remainder of the trip to Avery, Idaho, was without incident and report made on arrival called for renewal of the blown fuse and furnishing of extra fuses

### DISCUSSION

Apparently the distance between end insulators supporting the plank which carried the fuse holder brackets was sufficient to permit building up of vibrations in the bracket assemblies which could have been transmitted to the mid-point and weakest part of the fuse thus increasing tendency toward mechanical as well as electrical failures. Consideration could well be given to changes that would provide greater rigidity of fuse mounts on this type unit. Repetitious reports of blown fuses and motor generator set arcing should have been cause for investigation to ascertain reason for continued failures and determination of proper remedy

CAUSE OF ACCIDENT

It is found that this accident was caused by contact with an electrically energized part of the locomotive.

Dated at Washington, D. C., this 15th day of July, 1954.

By the Commission, Commissioner Clarke.

SEAL

GEORGE W LAIRD,

Secretary.