

Log R-463

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: February 22, 1984

Forwarded to:

Mr. R. C. Grayson
Chairman and Chief Executive Officer
Burlington Northern Railroad Company
176 East Fifth Street
St. Paul, Minnesota 55101

SAFETY RECOMMENDATION(S)
R-84-8 and -9

About 4:35 p.m. on July 18, 1983, 58 cars of Burlington Northern Railroad Company (BN) freight train No. MTC-0718, moving about 52 mph, were derailed on the main track near Crystal City, Missouri. Two of the derailed cars came to rest in the Mississippi River. Within the train's 94 cars were 17 maintenance-of-way (MW), ballast-laden hopper cars being transported to MW work locations north of St. Louis, Missouri. The train was being operated in revenue service without restriction. No one was injured in this accident, and no hazardous materials were involved. Damage was estimated to be about \$1,058,330. ^{1/}

The Safety Board determined that the probable cause of this accident was the displacement of the outer rail in a curve by a truck on an MW car, which could not slue to the track curvature because of a cracked and displaced centerplate. Contributing to the accident was the BN's failure to enforce its inspection and maintenance procedures for MW cars or to impose restrictions on their movement in revenue freight trains.

Postaccident examination of the derailed equipment disclosed that the body centerplate from one end of hopper car BN 958200 had separated from the car body during the accident and had multiple fractures with rust-covered surfaces. The examination also disclosed that two other ballast-laden hopper cars that were derailed in the accident, BN 958104 and NP 85412, had fractured body centerplates with rusted surfaces. The cars were not overloaded. All three of the ballast cars were stenciled "MW" in accordance with 49 CFR 215.305 and were dedicated to ballast hauling services.

On July 22, 1983, two Safety Board investigators went to the stone quarry near Hoxie, Arkansas, where the ballast cars involved in the accident had been loaded. They examined 21 hopper cars at that location that were loaded with ballast and ready for movement. Of the 21 cars, 2 cars were found to have fractured centerplates. Car GN 78206 was found to have fractured centerplates at both ends of the car. Car BN 958123 was found to have a fractured centerplate at the "B" end of the car. These conditions were brought to the attention of BN officials who then ordered the two cars to be transferred to the repair track at Memphis. Car GN 78206 received extensive repairs and was returned to service; car BN 958123 was later condemned and scrapped.

^{1/} For more detailed information, read Railroad Accident Report--"Derailment of Burlington Northern Railroad Company Freight Train No. MTC-0718, near Crystal City, Missouri, July 18, 1983" (NTSB/RAR-84/01).

BN officials stated to Safety Board investigators after the accident that it was BN policy to give, and that they were giving, MW cars the same maintenance inspections given to freight cars used in revenue service. They further stated that BN policy was to continue operating MW cars in revenue trains without imposing any additional restrictions to the operation of those revenue trains containing MW cars.

MW cars, especially those which are used in ballast hauling service, generally are subjected to severe operating practices. This is particularly true during periods of seasonally intensive railroad MW work, such as major ballasting and track-surfacing operations. During these periods MW cars often are subject to quick turnaround and extended use, hauling ballast between source sites and various work project locations. Further, MW cars used in ballast service often are subject to rough handling while being unloaded. MW crews unload such cars using chains and/or timbers affixed to the bottom outlet doors so as to regulate the flow of ballast onto the track while the car is moved at a slow pace. Often the ballast becomes obstructed and the flow slows unacceptably or stops prematurely. A common practice to restart the flow of unloading ballast is to rapidly gather and stretch the slack in the work train, thereby inducing a shock to dislodge the obstructed ballast. These induced shocks place severe stresses on the component members of the cars.

Most MW cars are older railroad freight cars which have been removed from revenue service and relegated to MW service. The Safety Board concludes that the severe stresses placed on equipment which has already deteriorated substantially in years of revenue service hastens component failures in MW cars. These component failures, such as the failed car body centerplates found on MW cars BN 958200, BN 958104, and NP 85412 at Crystal City, and on cars GN 78206 and BN 958123 at Hoxie, normally would be detected through routine periodic inspections if the cars were being used in revenue service. However, MW cars are exempt from the periodic inspection and mechanical requirements of the freight car safety standards of the Federal Railroad Administration (FRA).

Although the BN stated that its policy is to provide MW cars with the same inspections given to freight cars used in revenue service, it is apparent that the stated policy is not in fact a working practice. MW car BN 958200 had been on the Galesburg repair track about 2 weeks prior to the accident, and the inspection of the car while under repair should have detected the multiple fractures in the centerplate. The accident could have been prevented if the defective car body centerplate had been replaced at that time. The centerplate from MW car BN 958200 evidenced previous weldment repair. Although weldment repair of the body centerplate on MW cars is permissible because MW cars are not subject to the FRA's freight car safety standards or the interchange rules of the Association of American Railroads, such weldment repairs are not considered a safe practice, and are, in fact, banned from interchange and revenue service. The reliance on weldment repairs for MW cars suggests a fundamental deficiency in the BN's policy concerning the safety of train operations in placing such MW cars in high-speed freight trains.

Special instructions within the BN timetable restrict "... loaded unit ore, ballast and potash trains ..." to a maximum speed of 40 mph. However, no restriction is placed on the operation of trains containing ballast cars if the train is not a unit train. Train No. MTC-0718 was subject to a "heat order" that was issued to the crew in Memphis, Tennessee, on the day of the accident. Heat orders are issued to lower train-induced stresses on track with continuous welded rail during periods of high ambient temperatures. Under a BN heat order a train must be operated at a speed not to exceed 10 mph less than

the normal maximum allowable speed when the ambient temperature reaches or exceeds 90° F. The heat order further instructs the engineer not to use the train's dynamic brake to slow or stop his train. The heat order issued to train No. MTC-0718 did not specify the ambient temperature at the time the heat order was issued or what the expected high temperature was for July 18, 1983.

Although train No. MTC-0718 was being operated in excess of the reduced rate of speed prescribed by the heat order, the Safety Board believes that this was not a significant factor in the events culminating in this accident. The Safety Board concludes that the severely degraded condition of MW car BN 958200 would have resulted in an in-service failure even if the failure had occurred at the restricted speed. However, the severity of the accident might have been lessened somewhat had the derailment occurred at a 10-mph slower speed. The heat order stipulated that trains be operated 10 mph less than maximum speed when the temperature exceeded 90° F. The temperature at the time of the accident was about 95° F. Compliance with the heat order requires a train's engineer to know the ambient temperature over his entire operating district during his entire tour of duty, and to be able to recognize a wide variety of environmental factors affecting ambient temperature. It is apparent that BN management has set an unreasonable requirement for an engineer, because the engineer does not have a means to monitor ambient temperature. A more reasonable approach might be to issue train orders specifically restricting speeds at those times when the ambient temperature exceeds or is expected to exceed a predetermined level, and cancelling those specific orders when the ambient temperature falls below the predetermined level. Such specific train orders would remove the need for an individual judgment by each engineer as to whether the heat order is applicable.

Therefore, the National Transportation Safety Board recommends that the Burlington Northern Railroad Company:

Revise and enforce inspection and maintenance requirements for maintenance-of-way cars to be moved in revenue freight trains to make the cars suitable for safe operation up to the maximum speeds at which the cars will be operated. (Class II, Priority Action) (R-84-8)

Revise the procedure for the issuance and cancellation of a restricting train order due to high ambient temperatures to require that the order be issued for a specific restricting speed and be cancelled by the dispatcher when the ambient temperature falls below a predetermined level. (Class II, Priority Action) (R-84-9)

The National Transportation Safety Board is an independent Federal agency with the statutory responsibility "... to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). The Safety Board is vitally interested in any actions taken as a result of its safety recommendations, and would appreciate a response from you regarding action taken or contemplated with respect to the recommendations in this letter.

BURNETT, Chairman, and BURSLEY, ENGEN, and GROSE, Members, concurred in these recommendations. GOLDMAN, Vice Chairman, did not participate.


By: Jim Burnett
Chairman