

Log R-420-50

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: September 15, 1982

Forwarded to:

Mr. A. P. Funkhouser
President and Chief Executive Officer
The Family Lines System
500 Water Street
Jacksonville, Florida 32202

SAFETY RECOMMENDATION(S)

R-82-98 through -100

About 9:30 a.m. on December 28, 1981, Louisville and Nashville Railroad Company (L&N) northbound train No. 586 struck the rear of standing L&N train Extra 8072 North at New Johnsonville, Tennessee. Extra 8072 North had stopped on the main track just south of New Johnsonville on instructions from the train dispatcher at Bruceton, Tennessee. The locomotive had been detached, and the train's head-end crew had moved the locomotive into New Johnsonville to pick up three freight cars. Train No. 586 passed two consecutive wayside automatic block signals displaying an approach aspect (yellow) and a restricted proceed aspect (red), respectively, before it struck the rear of Extra 8072 North. The caboose and six cars of Extra 8072 North and five locomotive units and one car of No. 586 were derailed. The conductor of Extra 8072 North was killed, and the engineer and head brakeman of No. 586 were slightly injured. Damage was estimated at \$998,313. 1/

The engineer said that, a few miles north of Nashville, it was necessary for him to apply some retardation to the train in order to maintain speed control so that the 40-mph maximum authorized speed would not be exceeded. He said that when he attempted to control the speed of the train by use of the dynamic brake, a control panel light illuminated indicating a wheel slip-slide condition, and the ammeter, indicating traction motor load current, was about 200 amperes. 2/ Because he understood from his training and instruction that when this happened the dynamic brake should not be used, the engineer said he released the dynamic brake and made a minimum service brakepipe reduction, which is about 6 psi, with the automatic brake valve to apply the train's airbrakes. He said this application of the airbrakes did not slow the train's speed to his satisfaction, so he increased the brakepipe reduction to about 10 psi, which slowed the train to suit him. Thereafter, and during the remainder of the trip, he used 10 psi as a minimum service brakepipe reduction. He did not use any sand during his attempted use of the dynamic brake nor did he attempt to use the dynamic brake again during the remainder of the trip.

1/ For more detailed information read Railroad Accident Report--"Rear-End Collision of Louisville and Nashville Railroad Company Trains No. 586 and Extra 8072 North, New Johnsonville, Tennessee, December 28, 1981" (NTSB-RAR-82-4).

2/ The ammeter indicates only electrical current on the lead locomotive unit and the wheel slip-slide light indicator only indicates a wheel slip-slide on the locomotive consist. It does not identify on which unit or units the wheel slip-slide is occurring.

As the train continued northward, the engineer said he commented occasionally to the head brakeman that he had to use more air to control the train's speed than he felt was desirable. He said later that he did not think the train responded to braking demands as he thought a train of that weight and length should, but that the brakes did allow him to control the speed of the train.

The engineer said that as No. 586 approached the hot box detector near McEwen, he asked the head brakeman to "watch out" for him while he went to use the toilet facilities. There were no facilities on the lead locomotive unit, so the engineer had to leave the operating compartment and move back to the second unit. Specifically, the engineer said that he asked the head brakeman to sound the whistle for highway grade crossings and to announce the hot box detector to the crew on the caboose when the train passed it. The train was in a "static," steady pull situation and moving about 22 mph at that time, so the head brakeman should not have had to operate any of the operating controls. The L&N operating procedures require that an engineer stop his train if he has to leave the operating compartment and another qualified engineer is not present to take over the operating controls. The head brakeman was not a qualified engineer.

The engineer said that when he returned to the operating compartment, he resumed his position at the operating controls of the locomotive. The head brakeman had not been required to make any changes in the operating control settings during the engineer's absence from the operating compartment, but he had blown the whistle for several highway grade crossings and radioed the conductor when the locomotive passed the hot box detector. The head brakeman said that when he blew the whistle it was a little weak and he told the engineer that the whistle was not sounding a loud clear note each time it was blown.

The engineer said that as No. 586 approached Waverly, Tennessee, he slowed the train to about 25 mph by use of the automatic brake valve to comply with the reduced speed requirement of a town ordinance. The engineer said that as the train left Waverly, he released the airbrakes to allow the brakepipe to recharge for downgrade braking requirements north of Pursley, Tennessee. From near Pursley, the grade descended northward to near milepost 74.5 where it changed to an ascending grade. The engineer said that at the south end of Pursley he made a 10 psi minimum service brakepipe reduction with the automatic airbrake valve to maintain the maximum authorized train speed of 40 mph, but that there was no air exhaust from the brakepipe. Therefore, he said that he increased the brakepipe reduction from 12 to 14 psi, and the speed of the train was controlled so that it did not exceed 40 mph.

The engineer and head brakeman said that when the train approached automatic signal No. 73.6, the signal was displaying an approach (yellow) aspect, and that the train's speed was about 38 to 40 mph. L&N operating rule No. 285 requires that, upon approaching or passing an approach signal aspect, trains exceeding a speed of 30 mph must at once reduce to that speed, and the engineer should operate the train prepared to stop at the next signal. Rule No. 34 requires the crewmembers in the locomotive operating compartment to call automatic wayside signal aspects to each other, but they do not have to radio signal aspects to the crew on the caboose. Both crewmembers on the locomotive said that they called the signal aspects to each other.

The engineer said that in order to comply with the speed requirement of the approach signal aspect, he tried to reduce the speed of the train by further increasing the brakepipe reduction to 18 or 20 psi, but that again there was no brakepipe air exhaust, and that the train was not slowing to his satisfaction. The engineer and head brakeman

said that when the train approached automatic signal No. 75.6, the signal was displaying a restricted proceed (red) aspect, and the engineer estimated the train's speed to be about 20 to 25 mph. L&N rule No. 291 requires that, upon approaching or passing a restricted proceed signal aspect, trains exceeding a speed of 15 mph must at once reduce to that speed and the engineer should operate the train prepared to stop short of another train, obstruction, or switch not properly lined, looking out for broken rail. The engineer said that at that time, in an effort to slow the train, he made a full 26-psi service brakepipe reduction but that there still was no brakepipe air exhaust. He said that the speed of the train still was not reducing as he thought it should and, because he knew that he would be unable to comply with the speed requirement of the signal, he put the automatic brake control handle into the emergency position, shut the throttle off, and opened the sanders. He said that when he made the emergency brake application, he did not notice what he considered to be a proper air exhaust from the brakepipe, and that the speed of the train still was not reducing as he thought it should. The engineer said that even though he did not hear the expected brakepipe air exhausts when he made the brakepipe reductions, the air pressure indicating gauges indicated the proper value for each reduction he made. Also, the head brakeman said that he heard weak brakepipe air exhausts when the brake reductions were made.

As the train passed automatic signal No. 75.6, the engineer said that he was "fanning" ^{3/} the independent locomotive brake in an effort to stop the train but that the train continued to move at a speed he estimated to be 20 to 25 mph. He said that as an operating practice he always released the independent locomotive brake when the automatic airbrakes were in an emergency application. He said that he was "fanning" the independent locomotive brake so the wheels would not slide and thus reduce the locomotive's stopping ability and also to prevent causing flat spots on the wheels. Further, he said that he did not leave the independent brake on steadily because he did not see any reason for an immediate stop at that time.

Postaccident tests failed to reveal any reason why the train airbrakes should not have operated properly. The automatic brake handle was found in the handle off position and the dynamic brake control lever was found in the fully applied position after the accident. No sand was found on the tracks ahead of the point of collision.

The automatic brake handle being found in the handle off position and the dynamic brake control lever being found in the fully applied position do not comport with the head-end crew's testimony. The impact forces created by the locomotive's striking the rear of Extra 8072 North, which was standing with its airbrakes set in a heavy application, and the forces developed during the rolling and pitching of the unit could have caused the automatic brake handle and the dynamic brake control to have moved. Further, it is possible that a person in leaving the operating position hurriedly could have brushed against the automatic brake handle and moved it from the emergency position to the handle off position. However, since the first and only sand was found commencing at the point of impact, and the application of sand is automatically made when the train brakes apply in emergency, no matter how the emergency application is initiated, it appears that the automatic brake handle was not used before the collision to apply the emergency brakes. The train's airbrakes most likely applied in emergency when the anglecock on the brakepipe line on the lead unit was broken upon impact.

^{3/} Fanning is the use of the brake control lever by first applying and then releasing it in a forward and backward motion. It is a term normally used in conjunction with the automatic train brake.

The postaccident inspection of all the locomotive units indicated that sand was available on each unit, and it is likely that it would have been dispersed earlier if the train airbrakes had been applied in an emergency as the train approached automatic signal No. 75.6. Further, the position of the rear end of the train with respect to the point of impact when the emergency brake application was made, based on the testimony of the rear-end crew, establishes that no emergency brake application was made in approach to automatic signal No. 75.6. Whether or not there was a brakepipe air exhaust when the emergency brakes were applied would not have affected the automatic application of sand. Also, if the automatic brake handle had been in the emergency position, there would have been no flow of current through the excitation breaker at the time of impact and it would not have been tripped, whereas it was found in the tripped position after the accident. The likelihood of the breaker's being jarred into a tripped position is remote.

Much of the testimony and evidence presented as a result of this accident investigation causes the Safety Board to be strongly suspicious that the head brakeman rather than the engineer was operating the train before and during the time the train was approaching the area of the accident. This theory is supported by the following factors: the engineer's account of his actions in operating the train, which indicates that he misused the train's airbrakes; the engineer's reported operating techniques, such as fanning the independent locomotive brake when he decided the train was not slowing or stopping, which were not consistent with the manner in which a proficient engineer would be expected to operate; the engineer's not taking advantage of gravity or rolling friction on the ascending grade to slow the train, but instead applying power; the lack of automatically dispersed sand approaching automatic signal No. 75.6 where the engineer claims to have made an emergency brake application; the engineer being the first man out of the operating compartment when the caboose of Extra 8972 North was sighted, notwithstanding the fact that the head brakeman was reported to be on his feet in the center of the operating compartment and the awkward position a man in the operator's seat would be in to leave that seat quickly and move through the door behind him; the improper position of the operating controls found following the collision; the engineer's statement that he was too busy to radio his conductor on the caboose that No. 586 was passing the dragging equipment detector at automatic signal No. 75.6, when apparently he was only fanning the independent brake; the head brakeman's claim that he blew the whistle when he was aware of an impending collision; the fact that the head brakeman had operated locomotives and freight trains before and had an ambition to become a locomotive engineer; and the fact that the engineer was rated a proficient engineer by his supervisors, who had not found it necessary to accompany him on a trip because there were no reports or indications that he was experiencing operating problems.

Since the Safety Board cannot determine conclusively that the engineer was not operating the locomotive at the time of the accident, it must accept the foregoing as circumstantial and base its findings on the factual evidence at hand. However, the Safety Board concludes that, contrary to the engineer's testimony, he was not fully alert when the train passed automatic signal No. 75.6 and that he was startled into reality when he suddenly saw the caboose of Extra 8072 North ahead. When he was fully alerted to the caboose, he made one frantic effort to stop the train and then left the operating compartment.

It can be expected that at some time while an engineer is operating a locomotive, he or she may have to check equipment or use toilet facilities. It is operationally inconvenient and expensive to stop a train while an engineer goes back to a trailing unit to check a malfunctioning component or takes a break. Yet L&N brakemen are not trained or qualified to operate a locomotive nor are they instructed in the use of the locomotive or train airbrakes. Thus, situations may arise even when the engineer is in the operating

compartment that would require a head brakeman to slow or stop the train while he is seated at the controls. Moreover, the L&N operating rules prohibit unauthorized individuals, such as head brakemen, from operating a locomotive. The rules also require the engineer to remain in the operating compartment of the train while it is underway if no other qualified person is there to operate the locomotive. The L&N is apparently fulfilling the requirements of a State statute by ensuring that a crewmember remains in the operating compartment, but in doing so the L&N is acquiescing in the practice of allowing unqualified head brakemen to sit in the operating position while a train is underway in circumstances where there is no assurance that control settings will not have to be changed by an untrained person.

The engineer should not leave the operating compartment to check relays or locomotive control settings while the train is in motion unless a minimally qualified person, i.e., one who could stop the train safely if necessary, is present and remains in the operating compartment. If the L&N is going to utilize head brakemen to fulfill this function, the brakemen should be trained on the train's airbrake system and taught how to safely slow or stop a train.

Neither the conductor nor the rear brakeman monitored the brakepipe air pressure gauge mounted in the caboose, so they could not verify the engineer's claim that he was required to use more air than he thought he should have. The conductor did not check the speed of his train at any point even though he had been issued a train order restricting the speed of his train to 40 mph. Again, it appears that the conductor was not responsive to his responsibility of being in charge of the train.

On September 10, 1976, as a result of an accident investigation, 4/ the Safety Board recommended that the Federal Railroad Administration (FRA) "Promulgate rules to require enginecrews to communicate fixed signal aspects to conductors while trains are en route on signalized track. (R-76-50)" A similar recommendation was issued to the Association of American Railroads (AAR) on March 3, 1981: "Encourage member railroads to establish rules that require enginecrews to communicate fixed signal aspects to conductors while trains are en route on signalized track. (R-81-48)" 5/ The status of both recommendations is currently "Open—Unacceptable Action." The FRA has not adopted such a requirement, nor has the AAR given its support to such action. Despite this, some railroads believe this procedure has merit and have implemented the procedure which requires an acknowledgment from the conductor. 6/ The Safety Board continues to believe that such a procedure reinforces the alertness of the entire crew and enables any traincrew within radio coverage to be informed of the current situation. If such a procedure had been followed in this instance, the accident might have been avoided.

Therefore, as a result of its investigation of this accident, the National Transportation Safety Board recommends that the Louisville and Nashville Railroad Company:

4/ Railroad Accident Report—"Head-on Collision of Two Penn Central Transportation Company Freight Trains near Pettisville, Ohio, February 4, 1976" (NTSB-RAR-76-10).

5/ Railroad Accident Report—"Side Collision of Norfolk and Western Railway Company Train No. 86 with Extra 1589 West near Welch, West Virginia, September 6, 1980" (NTSB-RAR-81-2).

6/ Railroad Accident Report—"Head-on Collision Between Baltimore & Ohio Railroad Company Train No. 88 and the Brunswick Helper near Germantown, Maryland, February 9, 1981" (NTSB-RAR-81-6).

Establish a complementary protective system to the automatic block signals for trains stopped in automatic block signal territory against a following train . (Class II, Priority Action) (R-82-98)

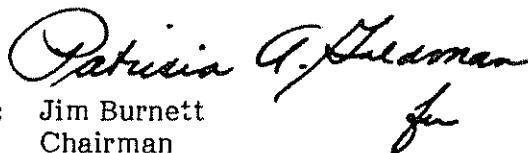
Determine if unqualified employees are operating locomotives with or without cars. If so, initiate corrective action so that Louisville and Nashville employees will be in conformance with the company operating rule that requires a qualified locomotive engineer to be present in the operating compartment of the locomotive while the train is in operation. (Class II, Priority Action) (R-82-99)

Require an engineer to radio the aspects displayed by all the wayside automatic and interlocking home signals affecting movement of the train to the conductor, and have the conductor acknowledge the aspect called. (Class II, Priority Action) (R-82-100)

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." (P.L. 93-633). The Safety Board is vitally interested in any actions taken as a result of its safety recommendations. Therefore, we would appreciate a response from you regarding action taken or contemplated with respect to the recommendations in this letter.

BURNETT, Chairman, GOLDMAN, Vice Chairman, McADAMS, BURSLEY, and ENGEN, Members, concurred in these recommendations.

By: Jim Burnett
Chairman

A handwritten signature in cursive script, appearing to read "Patricia A. Goldman". The signature is written in dark ink and is positioned to the right of the typed name "Patricia A. Goldman".