U.S. Department
of Transportation
Pipeline and Hazardous Materials Safety Administration

1200 New Jersey Ave., S.E.
Washington, DC 20590

AUG 18 2008

The Honorable Mark V. Rosenker
Chairman
National Transportation Safety Board
490 L'Enfant Plaza, SW
Washington, DC 20594

Dear Chairman Rosenker:

Thank you for your May 22 letter concerning safety recommendation R-08-13. The recommendation was issued following the National Transportation Safety Board's investigation of a train derailment on October 20, 2006, in New Brighton, Pennsylvania. In that incident, Norfolk Southern Railway Company (NS) train 68QB119 derailed while crossing the Beaver River railroad bridge. The train consisted of 3 locomotives, 3 empty freight cars, followed by 80 tank cars loaded with denatured ethanol, a flammable liquid. Twenty-three of the tank cars derailed, 20 of which released ethanol which ignited and burned. The probable cause of the accident was determined to be a broken rail. As a result of this accident, NTSB issued a safety recommendation to the Pipeline and Hazardous Materials Safety Administration (PHMSA). The recommendation states:

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> With the assistance of the Federal Railroad Administration, evaluate the risks posed to train crews by unit trains transporting hazardous materials, determine the optimum separation requirements between occupied locomotives and hazardous materials cars, and revise 49 Code of Federal Regulations 174.85 accordingly.

The Safety Board also issued safety recommendations to the Federal Railroad Administration (FRA) and the Norfolk Southern Railway Company.

FRA has been examining the issues surrounding in-train placement since the late 1970's. In-train placement requirements were developed to protect train crews from explosives shipped in wooden box cars that were exposed to cinders from steam locomotives. Beginning in the early 1900's, the Interstate Commerce Commission required cars transporting explosives to be placed in the middle of the train and no nearer than 16 cars from the locomotive and 10 cars from the caboose.

The demise of wooden box cars, the advent of the diesel electric locomotive, and increased knowledge of the risks associated with additional switching movements convinced the industry and government regulators to rethink the burdensome 16-car separation requirements. The

framers of the revised in-train placement regulations did not have sophisticated risk analysis models available to them when making these decisions. Instead, representatives from industry and government used their extensive knowledge of railroad operations and hazardous materials. Realizing that 16-car separations created safety and operational issues, these representatives created the 5-buffer car separation distance, the minimum evacuation distance found in emergency response guidelines. The solution satisfied both safety and operational requirements and created a safe working environment for train crews transporting hazardous materials.

The current requirements for positioning placarded rail cars in a train are specified in 49 CFR 174.85(d). For Placard Group 2 materials, including Class 3 materials such as ethanol, this section requires a placarded car to be no nearer than the sixth car from the engine or occupied caboose when train length permits. This requirement applies so long as there are sufficient non-hazardous materials rail cars within the standing train consist to fulfill the requirement. When train length does not permit placement of a placarded car no nearer than the sixth car from the engine or occupied caboose, the placarded car must be placed near the middle of the train, but not nearer than the second car from the engine or occupied caboose. The phrase "when train length does not permit" means that the train does not have sufficient buffer cars in the consist to locate the placarded car(s) six deep and, therefore, the placarded car(s) must be placed near the middle of the train.

Since 1979, DOT and the railroad industry have conducted a number of research studies on in-train placement and commingling of various hazardous materials. For example, a Transportation Systems Center study of March 1979, entitled "Strategic Positioning of Railroad Cars to Reduce Risk of Derailment," concluded that the risk of derailment is higher in the forward section of the train than in the rear third or rear quarter of the train.

A Battelle study, completed in September 1989, entitled "Hazardous Materials Car Placement in a Train Consist," concluded that the safest section is the rear quarter or third followed by the first quarter of the train. In addition, the study noted that the additional switching moves that would be required to keep the hazmat cars in the rear third of the train may increase safety risks. Train crew exposure to accidents or injuries increases significantly with additional switching moves required to maintain station-order blocks, as well as from train weight and length distribution derailment related issues.

The Canadian Institute of Guided Ground Transport conducted a study in March 1991 entitled "Assessment Of Dangerous Goods Regulations In Railway Train Marshalling" which concluded that regulatory constraints to rail industry standards (e.g., marshalling) may be counterproductive to safe train handling. The distribution of railcars via weight and size within the consist is crucial to maintaining the balance required to handle a train safely.

In 2005, FRA issued a report to Congress entitled "Safe Placement of Train Cars." As stated therein, "For reasons set forth in this report, FRA currently sees no merit in disturbing established and very effective requirements already embodied in the Department of Transportation's Hazardous Materials Regulations. Although there is a theoretical basis for adoption of various refinements to train placement requirements, in no case is it apparent that their implementation would offer advantages sufficient to offset the costs involved--particularly

the safety risk associated with additional switching of cars." The current in-train placement and separation regulations have served the cause of safety well, and no body of evidence has emerged from the analysis of accidents or incidents to suggest the need for sudden or drastic overhaul.

In Safety Recommendation R-08-13, NTSB states that "Although the five-car buffer standard is considered to have been validated over many years, the one-car buffer standard for unit trains does not have as lengthy a historical record and may not be sufficiently validated by historical data." DOT has documentation that C-I-L Incorporated started moving unit trains of sulfuric acid in 1967 in Canada. The unit trains were extended in 1977 into Detroit, Michigan, and in 1979 into Searsport, Maine. In 1981, C-I-L Incorporated moved 422 million ton miles with these unit trains, 50 million being to these two destinations in the United States. Since the early 1980's, FRA has interpreted the in-train placement regulations to require that unit trains have at least one buffer car.

There is additional evidence of safe operations in Canada. For more than 10 years, Transport Canada has allowed unit trains of placarded tank cars to operate without the use of any buffer cars. In the case of mixed freight trains with hazmat cars in the consist, Transport Canada requires one buffer car between the locomotive and the placarded tank car. Transport Canada has not identified any significant incidents that suggest a need to revise its current requirements. Neither of the major Canadian railroads has had an incident where hazardous materials placement specifically contributed to a train handling derailment.

In Safety Recommendation R-08-13 NTSB suggests that "adding a specified number of buffer cars to a *(unit)* train at the originating yard generally should not entail additional switching of the hazardous materials cars and, therefore, would not cause increased risks. Rather, the additional separation could provide greater protection to the train crews in the event of an accident." As stated in the 2005 FRA report to Congress, there are two distinct safety issues concerning railroad consist practices, first, "make-up of trains in such a manner as to prevent derailments caused by in-train forces, and, second, placement of hazardous materials cars in trains so as to avoid harm to crew members or interaction of hazardous materials, should a train accident or other unintended release occur." In the make-up of unit trains at origin, there may not be sufficient loaded, non-placarded cars available to add to the consist as buffer cars. A change to the current regulations as recommended by NTSB would require the addition of empty cars to the consist. This may have a negative impact on railroad costs and operations. More importantly, the addition of five empty cars between the locomotive and the placarded cars, while possibly reducing risk of exposure to the crew during a train's operation, may introduce additional risks of derailment.

According to the FRA report to Congress, "...the preferred location for loaded cars is towards the front of the train because, under braking, heavy cars decelerate more slowly than empty cars and, if placed towards the rear, would 'push' the more rapidly decelerating empty cars in front of them and generate high buff forces. Another danger of placing extended strings of light cars ahead of loads is the 'stringline' effect." The report further discusses accidents that have occurred due to "stringlining." "Analysis of the July 14, 1991 accident at Dunsmuir, California, shows that the pulling force of the engines combined with the drag of heavy loads may cause a

group of light cars (especially long, light cars) to be pulled off the tracks and towards the inside of a curve." The report discusses the November 9, 1977 accident at Pensacola, Florida, where "a derailment, at least partly attributable to the 'stringline' effect, led to the puncture of a tank car of anhydrous ammonia and the resulting gas cloud caused 2 deaths, many injuries, and the evacuation of 1,000 people."

The probable cause of the New Brighten, Pennsylvania accident was determined to be a broken rail. There is no evidence that train placement contributed to the derailment. Based upon the safe history of unit trains operating under the current regulations, we respectfully request that you classify recommendation R-08-13 as "Closed-Acceptable Action." We thank you for your consideration of our request.

Sincerely,

Stacey L. Gerard
Assistant Administrator/Chief Safety Officer