



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: April 25, 2007

In reply refer to: R-07-4 and -5

Vice Admiral Thomas J. Barrett
Administrator
Pipeline and Hazardous Materials Safety Administration
400 7th Street, S.W.
Washington, D.C. 20590

On Sunday, July 10, 2005, about 4:15 a.m., central daylight time,¹ two CN freight trains collided head on in Anding, Mississippi. The collision occurred on the CN Yazoo Subdivision, where the trains were being operated under a centralized traffic control signal system on single track. Signal data indicated that the northbound train, IC² 1013 North, continued past a *stop* (red) signal at North Anding and collided with the southbound train, IC 1023 South, about 1/4 mile beyond the signal. The collision resulted in the derailment of 6 locomotives and 17 cars. About 15,000 gallons of diesel fuel were released from the locomotives and resulted in a fire that burned for about 15 hours. Two crewmembers were on each train; all four were killed. As a precaution, about 100 Anding residents were evacuated; they did not report any injuries. Property damages exceeded \$9.5 million; clearing and environmental cleanup costs totaled about \$616,800.³

The National Transportation Safety Board determined that the probable cause of the July 10, 2005, collision in Anding, Mississippi, was the failure by the crew of the northbound train (IC 1013 North) to comply with wayside signals requiring them to stop at North Anding. The crew's attention to the signals was most likely reduced by fatigue; however, due to the lack of a locomotive cab voice recorder or the availability of other supporting evidence, other factors cannot be ruled out. Contributing to the accident was the absence of a positive train control system that would have stopped the northbound train before it exceeded its authorized limits. Also contributing to the accident was the lack of an alerter on the lead locomotive that may have prompted the crew to be more attentive to their operation of the train.

Availability of Train Consist Information

Federal regulations require that an accurate train consist documenting the location and type of hazardous materials in transport be kept and maintained on board the occupied

¹ All times are central daylight time.

² IC were the initials of the Illinois Central Railroad, which was acquired by the CN in 1999.

³ For additional information, see National Transportation Safety Board, *Collision of Two CN Freight Trains, Anding, Mississippi, July 10, 2005*, Railroad Accident Report NTSB RAR-07/01 (Washington, DC: NTSB, 2007).

locomotive of every freight train. The train consist is typically electronically generated at a train's origination point. When changes to the consist occur en route as a result of setouts and/or pickups (for example, the southbound train crew setting out and picking up cars at Greenwood), the conductor is required to correct the train consist by hand to ensure it reflects an accurate listing of the cars. Train consists are electronically updated in the CN Homewood Rail Traffic Control Center only when a train passes by an Automatic Equipment Identification (AEI) reader. These readers identify cars on a train by the identification tags on the cars as they pass, and then they automatically relay information back to the central computer to update the master train consist. The southbound train passed two AEI readers en route from Memphis; however, both were located north of Greenwood, where the crew had set out and picked up cars. The next AEI reader that the southbound train would have passed, if not for the collision, was located beyond Anding. Consequently, the only accurate consist for the southbound train was the crew's hand-corrected copy on board the train.

As a result of the collision, derailment, and fire, all four crewmembers were killed, and all six locomotives and both on-board train consist documents were destroyed. When emergency response personnel arrived on the accident scene, about 4:41 a.m., it was dark; the fire was intense; and heavy black smoke prevented them from visually identifying all the hazardous materials tank cars in the wreckage. When the first CN official arrived, about 5:25 a.m., he told emergency responders that he believed two CN trains had collided, but he did not have any train consist documents or knowledge about the hazardous materials on either train.

About 5:45 a.m., the CN official obtained accurate consist information about the derailed cars on the northbound train via cell phone from the CN dispatcher and provided it to emergency responders, but cell phone service was disrupted before any information about the southbound train could be obtained. In the absence of a consist for the southbound train, continuing attempts were made to identify hazard placards and car stenciling at the accident site. Although the CN officials and emergency responders were able to visually identify the four hydrogen cyanide tank cars from their unique paint schemes and determine that they did not derail, they could not identify the derailed cars in the southbound train nor determine the potential hazardous materials threats.

A CN clerk from Jackson delivered copies of the consists for both trains about 6:45 a.m., about 2 1/2 hours after the collision occurred and about 2 hours after the fire chief had made his initial request upon arriving at the scene. Yet, the consist that the CN delivered for the southbound train did not accurately reflect the actual makeup of the southbound train at the time of the accident because it did not reflect the cars the crew had set out and picked up at Greenwood. CN representatives did not realize that the cars that had derailed from the southbound train did not match those listed on the consist until they attempted to create a map of the derailment. An accurate listing of the cars that had derailed from the southbound train and were involved in the fire was eventually developed by a site survey of the scene.

Diesel fuel was the cause of the fire in this accident. The limited release of hazardous materials from venting tank cars did not contribute to the severity of the accident. However, the lack of immediately available train consists prevented emergency responders from making a quick assessment of the potential for a hazardous materials release. Train consist documents are a vital source of information for emergency responders when they are trying to determine what

hazardous materials might be involved in a derailment. It is essential that the information contained in these documents accurately reflect the current position of each railcar containing a hazardous material. Not having an accurate train consist makes it difficult for emergency responders to properly assess and manage an accident scene. Because the consist for the southbound train was never updated in the CN central computer system, the only up-to-date consist was the on-board document that was destroyed in the accident. The Safety Board concludes that because the CN did not have the capability to provide an accurate consist for the southbound train after the on-board document was destroyed, emergency responders were unable to promptly identify all the hazardous materials cars involved in the accident and timely assess the threat from a hazardous materials release.

The Safety Board previously addressed the importance of timely and accurate train consists in its investigations of the Thermal, California,⁴ and Miamisburg, Ohio,⁵ accidents. The Board addressed the same safety issues in its investigation of a derailment that occurred in Akron, Ohio, on February 26, 1989.⁶ In the Akron accident, as in the accident in Anding, the train consist provided to emergency responders was not accurate in that it did not reflect the setouts and pickups that the crew made between the time the train departed and the time it derailed, and as a result there was confusion about what hazardous materials were involved in the accident. Although the train crew from the Akron accident survived and was eventually able to update their consist information from memory, valuable time was lost and emergency responders were unable to properly assess and manage the accident scene. At the time of the accident, there were no Federal regulations requiring a train crew to maintain an up-to-date listing of the position of each hazardous materials car in the train. As a result, the Board recommended that the Federal Railroad Administration (FRA)

R-90-38

Revise 49 CFR 174.26(b) to require the traincrew to maintain, at all times, a document reflecting the current position of hazardous materials cars in the train.

The FRA responded that it agreed with Safety Recommendation R-90-38; as a result, with the FRA's cooperation, the Research and Special Programs Administration⁷ published a final rule on January 8, 1997. The new rule revised 49 *Code of Federal Regulations* (CFR) 174.26 to mandate that a train crew carry an on-board document reflecting the current position of each railcar transporting a hazardous material in a train. The new rule also required that the train

⁴ National Transportation Safety Board, *Derailment of Southern Pacific Transportation Company Train No. 01-BSMFF-05, Carrying Radioactive Material, at Thermal, California, January 7, 1982*, Railroad Accident Report NTSB/RAR-83/01 (Washington, DC: NTSB, 1983).

⁵ National Transportation Safety Board, *Hazardous Materials Release Following the Derailment of Baltimore and Ohio Railroad Company Train No. SLFR, Miamisburg, Ohio, July 8, 1986*, Hazardous Materials Accident Report NTSB/HZM-87/01 (Washington, DC: NTSB, 1987).

⁶ National Transportation Safety Board, *Derailment of a CSX Transportation Freight Train and Fire Involving Butane, Akron, Ohio, February 26, 1989*, Hazardous Materials Accident Report NTSB/HZM-90/02 (Washington, DC: NTSB, 1990).

⁷ The Pipeline and Hazardous Materials Safety Administration was subsequently assigned regulatory jurisdiction over this area after a U.S. Department of Transportation reorganization in 2004.

crew update the consist when cars are added or removed from a train en route. Based on the FRA's response, Safety Recommendation R-90-38 was classified "Closed—Acceptable Action."

The accident at Anding demonstrates that accurate train consists may not be available if the on-board documents are destroyed in an accident. Also, the death or injury of crewmembers may prevent or hinder emergency response personnel from accessing accurate consist information in a timely manner. Given the critical importance of providing timely and accurate information to emergency responders about the hazardous materials on an accident train, the Safety Board does not consider a railroad's reliance upon the on-board consist as the only up-to-date listing to be prudent or responsive, especially when a railroad is transporting hazardous materials. The Safety Board concludes that to ensure the safety of emergency responders and the public, railroads must have the ability to quickly provide emergency responders complete information about the specific hazardous materials being transported on a train and their location within it, regardless of the availability of the on-board consist.

At the time Safety Recommendation R-90-38 was issued, computer and communications technologies were far less advanced than they are today. Although some railroads have experimented or are experimenting with various electronic technologies to maintain available and up-to-date consist information, other railroads have not. Electronic tracking systems and modern computer and communication systems can provide a railroad with the flexibility and capability to generate, maintain, retrieve, and promptly deliver up-to-date consists for any of its operating trains to emergency responders. Therefore, the Safety Board believes that the Pipeline and Hazardous Materials Safety Administration (PHMSA) should, with the assistance of the FRA, require that railroads immediately provide to emergency responders accurate, real-time information regarding the identity and location of all hazardous materials on a train.

Emergency Planning and Preparedness

Effective emergency planning is an issue that has been addressed by the Safety Board as a result of several railroad accidents dating to the mid-1980s. Most recently, after the Texarkana, Arkansas, accident⁸ that occurred in 2005, the Board found that the lack of emergency planning, particularly joint training exercises and drills, left the city of Texarkana and the Union Pacific Railroad ill-prepared to effectively respond to the accident. As a result, the Board issued the following recommendation to the International Association of Fire Chiefs:

I-06-2

Notify your members about the circumstances of the accident in Texarkana, Arkansas, on October 15, 2005, and urge them to coordinate with all regional and local transporters of hazardous materials, such as railroads and trucking companies, to establish effective communications and coordination through joint emergency response drills and exercises.

⁸ National Transportation Safety Board, *Collision of Two Union Pacific Railroad Freight Trains, Texarkana, Arkansas, October 15, 2005*, Railroad Accident Brief NTSB/RAB-06/04 (Washington, DC: NTSB, 2006).

The Safety Board has investigated a number of rail accidents in which the coordination of response efforts between the railroads and local communities needed improvement. The issue surrounding the lack of a timely delivery of accurate train consist information that emerged after the accident in Anding has also been a recurring problem. The Board has long advocated joint drills and exercises between the railroads and local communities as measures to improve their respective emergency response efforts.⁹

State and local community emergency planning for hazardous materials incidents occurs largely through the Hazardous Materials and Emergency Preparedness (HMEP) grant program administered by PHMSA through the National Response Team (NRT). The HMEP program was established with the intent of enhancing State and local hazardous materials emergency planning and training by providing local communities with the necessary resources and tools to develop plans, training programs, drills, and exercises. However, awarding of the grants is not contingent upon local communities conducting joint training or drills with transporters and shippers of hazardous materials in their geographical areas. Consequently, States and local communities are not compelled to conduct planning, drills, or exercises with railroads and other transporters of hazardous materials in their localities.

Awarding the grants without specific expectations raised problems that also were addressed by the Office of Management and Budget's (OMB's) 2005 study of the HMEP program. Although the HMEP program was designed to provide the States and local communities the flexibility to develop their own emergency plans and training programs, the OMB determined that this flexibility had led to a lack of accountability and some States and local communities were not meeting their program goals. The OMB found that the States and local communities were not required to address or track progress toward their goals and that there was no formal, independent evaluation by PHMSA or any other Federal body to determine whether specific grants improved emergency planning or increased its effectiveness.

The Occupational Safety and Health Administration (OSHA) requires that railroads must develop and implement a hazardous materials emergency response plan in accordance with the provisions of 29 CFR 1910.120. However, the regulations address only the structure and content of an emergency plan by requiring that the plans cover 11 areas of concern, including "pre-emergency planning and coordination with outside parties" and "critique of response and follow-up." The regulations do not include any additional standards or instructions about how to evaluate the effectiveness of an emergency plan through drills and exercises with "outside parties." Appendix C of the OSHA regulations states that an employer "should assure" that its emergency plan is compatible with the established local plan and further notes that the major reference used to develop local emergency plans is the *Hazardous Materials Emergency Planning Guide*, the NRT-1. OSHA does not oversee or review any of these emergency plans, but rather relies upon employers to certify their own plans. Railroads are not specifically required under OSHA regulations to coordinate with communities about hazardous materials emergency planning.

⁹ According to the CN, from 2003 through 2006, the CN participated in 256 tabletop exercises or mock disaster drills within the United States. Of this number, 55 were conducted in Mississippi and 2 of those exercises and/or drills took place in Yazoo City.

Nevertheless, through their respective industry associations, transporters, including the railroads, and shippers of hazardous materials have made efforts to reach out to communities through programs, such as Transportation Community Awareness and Emergency Response (TRANSCAER),¹⁰ to enhance community awareness about the transportation of hazardous materials. TRANSCAER workshops typically provide a 1-day course to the local emergency planning committees consisting of familiarization with a cargo tank and its components and an exercise involving a simulated chemical release and practice using various containment techniques to plug or patch a leak on a cargo tank or railcar. Although TRANSCAER workshops provide valuable training for local emergency responders, the workshops alone do not provide the level of effective planning that is needed between the railroads and local communities.

It is the Safety Board's position that effective emergency planning between railroads and local communities should foster the voluntary exchange of emergency response plans, the maintenance of the plans by all parties, and the evaluation of the plans' effectiveness. Further, effective planning demands that the railroads and local communities jointly organize and participate in drills and exercises as a way of becoming familiar with each other's plans and as a means of testing the plans' overall effectiveness. Currently, PHMSA's HMEP program and OSHA's regulations provide parallel but independent processes for developing and implementing emergency response plans. Although PHMSA and OSHA are both members of the NRT emergency preparedness committee, more can be done to integrate local community emergency response and railroad emergency planning, including verification that local jurisdictions and railroads are conducting joint drills and exercises. Consequently, the Safety Board concludes that there are no mechanisms in place to verify that local jurisdictions that receive HMEP grant funds and railroads are conducting effective emergency planning for hazardous material releases resulting from rail accidents.

As interagency partners on the NRT Training and Curriculum Subcommittee, PHMSA and OSHA could better coordinate to ensure that more effective emergency planning occurs. For example, under the HMEP program, grants could be awarded on the condition that local communities be required to conduct joint training exercises and drills with railroads and other transporters of hazardous materials operating in their communities. OSHA also could strengthen its regulations to require and then verify that railroads are coordinating with local communities. PHMSA and OSHA also could jointly endeavor to specify in the NRT-1 emergency planning guidance that local communities and railroads conduct joint training drills and exercises. Therefore, the Safety Board believes that PHMSA should require and verify that States and their communities that receive funds through the HMEP grant program conduct training exercises and drills with the joint participation of railroads and other transporters of hazardous materials operating within their jurisdictions as a means of evaluating State, regional, and local emergency hazardous materials response plans.

¹⁰ TRANSCAER is an outreach program intended for the hazardous materials transportation industry to work with local emergency planning committees and provide unique hands-on training using actual transportation equipment. TRANSCAER develops training tools, helps participants establish relationships with industry contacts and emergency responders, and conducts numerous training events. TRANSCAER sponsors include the American Chemistry Council; the American Association of Railroads; the Chemical Educational Foundation; the CHEMical TRansportation Emergency Center (CHEMTREC®); The Chlorine Institute, Inc.; and the National Tank Truck Carriers, Inc.

Therefore, the National Transportation Safety Board makes the following recommendations to the Pipeline and Hazardous Materials Safety Administration:

With the assistance of the Federal Railroad Administration, require that railroads immediately provide to emergency responders accurate, real-time information regarding the identity and location of all hazardous materials on a train. (R-07-4)

Require and verify that States and their communities that receive funds through the Hazardous Materials and Emergency Preparedness grant program conduct training exercises and drills with the joint participation of railroads and other transporters of hazardous materials operating within their jurisdictions as a means of evaluating State, regional, and local emergency hazardous materials response plans. (R-07-5)

The Safety Board also issued safety recommendations to the Federal Railroad Administration, the Occupational Safety and Health Administration, the CN, and all Class I railroads.

Please refer to Safety Recommendations R-07-4 and -5 in your reply. If you need additional information, you may call (202) 314-6177.

Chairman ROSENKER, Vice Chairman SUMWALT, and Members CHEALANDER and HIGGINS concurred in these recommendations. Member HERSMAN concurred with Safety Recommendation R-07-4, but disapproved Safety Recommendation R-07-5. Member HERSMAN filed the following concurring and dissenting statement.

[Original Signed]

By: Mark V. Rosenker
Chairman

Notation 7870**Member Hersman, Concurring in part and Dissenting in part:**

While I supported adoption of this report, I do not support the issuance of Recommendations 5 and 6.

Recommendation 5 to the Pipeline and Hazardous Materials Safety Administration (PHMSA) recommends that the agency require and verify that States and their communities that receive funds through the Hazardous Materials and Emergency Preparedness (HMEP) grant program conduct training exercises and drills with the joint participation of railroads and other transporters of hazardous materials operating within their jurisdictions. I do not believe the circumstances of this accident make the case for this recommendation for the following reasons:

- There is no information in this report that describes any HMEP grants to the State of Mississippi or the Bentonia Volunteer Fire Department.
- The community did conduct an exercise prior to the accident. On March 17, 2004, Yazoo County conducted a tabletop exercise with the CN and 20 different emergency response groups including the county's Emergency Incident Planning Committee.
- The emergency response in this accident was appropriate. The problem with the post-accident response in this accident was the railroad's failure to provide responders with an accurate consist. Despite this deficiency, the responders worked around the problem and prevented additional loss of life and damage to property. Their response was timely, effective and appropriate. The issue of providing accurate consists is appropriately addressed in Recommendation 2 to the Federal Railroad Administration and Recommendation 4 to PHMSA.

Additionally, I do not believe our recommendation is appropriate because the established purposes for expenditures of HMEP funds are not limited to conducting training exercises and drills. Grant recipients may find it more beneficial to use their allocation of funds to train emergency responders in hazmat awareness and recognition or for emergency circumstances other than rail accidents and tank car releases.

Similarly, I do not believe that Recommendation 6 to the Occupational Safety and Health Administration (OSHA) is justified. OSHA's mission and regulatory scheme are focused on protecting employees in their work place. While it is true that OSHA has a regulation (29 CFR 1910.120) requiring railroads to have an emergency response plan, OSHA does not require drills (joint or otherwise) and, according to this report, does not "oversee or review" any of the response plans. I believe it is unreasonable to expect that OSHA, which currently relies on employers to certify their own emergency response plans, will nevertheless require railroads to conduct joint response drills for the benefit of

communities. Again, the community response to this accident was appropriate. The breakdown was in securing an accurate train consist from the railroad, an issue that is more effectively addressed by other recommendations in this report.

Deborah A. P. Hersman
March 23, 2007