



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: February 15, 2002

In reply refer to: R-02-4

Mr. Garry L. Briese
Executive Director
International Association of Fire Chiefs
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The National Transportation Safety Board is an independent Federal agency charged by Congress with investigating transportation accidents, determining their probable cause, and making recommendations to prevent similar accidents from occurring. We are providing the following information to urge your organization to take action on the safety recommendation in this letter. The Safety Board is vitally interested in this recommendation because it is designed to prevent accidents and save lives.

This recommendation addresses the issue of emergency response and is derived from the Safety Board's investigation of the March 15, 1999, grade crossing accident in Bourbonnais, Illinois, and is consistent with the evidence we found and the analysis we performed. As a result of this investigation, the Safety Board has issued five safety recommendations, one of which is addressed to the International Association of Fire Chiefs and the International Association of Fire Fighters. Information supporting this recommendation is discussed below. The Safety Board would appreciate a response from you within 90 days addressing the actions you have taken or intend to take to implement our recommendation.

About 9:47 p.m. on March 15, 1999, National Railroad Passenger Corporation (Amtrak) train 59, with 207 passengers and 21 Amtrak or other railroad employees on board and operating on Illinois Central Railroad (IC) main line tracks, struck and destroyed the loaded trailer of a tractor-semitrailer combination that was traversing the McKnight Road grade crossing in Bourbonnais, Illinois. Both locomotives and 11 of the 14 cars in the Amtrak consist derailed. The derailed Amtrak cars struck 2 of 10 freight cars that were standing on an adjacent siding. The accident resulted in 11 deaths and 122 people being transported to local hospitals. Total Amtrak equipment damages were estimated at \$14 million, and damages to track and associated structures were estimated to be about \$295,000.¹

¹ For more information, see National Transportation Safety Board, *Collision of National Railroad Passenger Corporation (Amtrak) Train 59 With A Loaded Truck-Semitrailer combination at a Highway/Rail Grade Crossing in Bourbonnais, Illinois, March 15, 1999*, Railroad Accident Report RAR/NTSB-02/01 (Washington, D.C.; NTSB, 2002).

About 9:51 p.m., an officer of the Bourbonnais Police Department, who had overheard the initial radio notification of the accident while on routine patrol, arrived at the accident scene. At about the same time, a Bradley Police Department officer arrived on the east side of the tracks. The Bourbonnais police officer reported that a locomotive was on fire and that a number of Amtrak passenger cars had derailed. He observed that the fire was growing, and that it was working its way toward the rear of the locomotive, where a sleeper car (No. 32035) had come to rest. He radioed for additional emergency response support, and he and the Bradley police officer began helping to evacuate the passenger cars. Within a short time, more police units responded, and officers began evacuating passengers wherever they could.

The chief of the Bourbonnais Fire Protection District received the call to dispatch while on scene at a previous response call. While en route to the accident scene, he overheard radio transmissions from responders already at the scene. As incident commander, he radioed a “box alarm” to summon emergency equipment and personnel. He arrived at the accident scene at about 9:52 p.m. Upon arrival, he conducted an initial assessment of the situation and identified the locomotive fire and the necessity for passenger evacuation. About 10:05 p.m., he placed a radio call for additional mutual aid emergency response support. The chief then established a fire department field command post at the initial staging area.²

About 9:53 p.m., the first ambulances arrived at the scene. About 9:59 p.m., Bourbonnais Fire Protection District Squad 62 arrived at the scene. The squad 62 truck had a water capacity of 500 gallons dispersed through 1 3/4-inch hose lines. The truck was also equipped with 5-gallon fire suppression foam containers.³ Firefighters then began hand-line water and foam application on the burning locomotive, but they were unable to put out the fire before exhausting their water supply.

About 10:00 p.m., Bourbonnais Fire Protection District Engine 61, a pumper truck carrying about 2,000 feet of 5-inch hose line, arrived at a water hydrant about 2,600 feet from the site of the fire. Firefighters laid out the full length of the hose on their truck, then went to the accident scene. A second pumper truck connected the additional hose line needed to reach the fire scene.

About 10:22 p.m., incident command issued a radio request to responding agencies seeking fire suppression foam. Several units responded, but each carried a small number of 5-gallon containers of foam and eductor systems designed to mix the foam with water for application to a fire.

About 10:24 p.m., the 5-inch hose supply line that was laid along the unpaved road was fully charged and supplying water at the west side of the site. Fire suppression on the burning locomotive recommenced shortly thereafter.

A responding Braidwood Fire Department officer, who was also the emergency response administrator of a petrochemical operation in Elwood, Illinois, said that shortly after he arrived on scene about 10:40 p.m., he recognized that the fire suppression foam at the scene was almost

² Although there is no record of a radio transmission to this effect, incident command participants reported to the Safety Board that the establishment of the command post was understood.

³ Refers to 5-gallon containers of aqueous film-forming foam or similar foam concentrate.

exhausted. He said he also realized that the fire suppression effort had not been effective in extinguishing the locomotive fire. The fire, as he observed it, was “3-dimensional” and petroleum-based, and it remained entrenched within the upper confines of the locomotive carbody wreckage, which made suppression access particularly difficult. He stated that he believed the strategy being used up to that point was having only limited success, because the fire would be extinguished in one location, only to re-ignite in an adjacent location and flash back to the original location. Further, the fire was directly impinging upon and passing beneath the still-occupied sleeper car 32035.

From this, the Braidwood officer concluded that the application of a large volume of fire suppression foam might be an effective attack strategy and that, therefore, a heavy foam tanker truck from the nearest available facility should be used. The Braidwood officer discussed with the incident commander the possibility of organizing a mutual aid heavy foam tanker truck response to the scene.

The incident commander concurred with this proposed strategy, and the Braidwood officer immediately placed a cellular telephone call asking that a heavy foam tanker truck and personnel from the Stepan Chemical Company near Joliet, Illinois, be dispatched to the accident site. The officer arranged for a similar request to be made to a Mobil Oil refinery. Both facilities are about 35 miles away from the accident scene, and the officer anticipated that the trucks might require about 45 minutes to arrive.

About 10:47 p.m., the Braidwood Fire Department heavy rescue truck arrived at the west side staging area. It was then used as a fire suppression field command post.

About 10:55 p.m., incident command issued a request to all responding agencies for all available water tanker truck support.

About 11:19 p.m., incident command radioed that the main body of the fire on the east side of the scene appeared to have been “knocked down,” which suggested that the fire was somewhat in control, although not extinguished, in that area.

About 11:30 p.m., a heavy foam tanker truck from Stepan Chemical Company arrived and was directed to the west side staging area. About 11:45 p.m., the foam tanker truck reached the west side staging area and set up near the wreckage pileup. The Braidwood Fire Department officer who organized the Stepan response directed that water supply connections be made to one of the pumper trucks stationed at that location and that fire suppression by hand-line commence immediately. Fire suppression water/foam solution was applied to the main body of the fire in the proximity of the locomotive and the sleeper car until the fire was extinguished; the fire was out within a few minutes. Water/foam solution application continued periodically thereafter, because firefighters were concerned that hot metal in the wreckage might re-ignite the fire.

Several minor rekindle events occurred in the wreckage at times throughout the night; the fires were quickly extinguished by firefighting crews that remained on the scene. The fire was completely extinguished by dawn on March 16.

According to the requirements of 49 *Code of Federal Regulations* 239.101(a)(5), every passenger railroad and every railroad hosting passenger train service must jointly adopt a single

emergency preparedness plan describing the procedures to be followed in an emergency. The regulation requires that each railroad organize a liaison with emergency responders in order to familiarize these emergency responders with the passenger railroad equipment, facilities, and communications interfaces.

In order to implement the emergency response liaison element of its emergency preparedness plan, Amtrak provides, upon request, an instructional information/training program for those local agencies most likely to respond to an Amtrak emergency. This training program includes training materials such as manuals and an instructional videotape. In addition, Amtrak offers on-site instruction sessions during which a representative of the railroad gives a training course directly to the local emergency response agencies. This training course is provided whenever possible. Amtrak, however, notes that it operates through regions that encompass about 15,000 emergency response agencies and that, because of limited resources, on-site training is not provided for all agencies that may be called upon to respond to an Amtrak emergency. For example, before the accident, Amtrak had not provided any on-site instruction or training to the Bourbonnais Fire Protection District or to other Kankakee County emergency responders. Amtrak did conduct passenger train emergency response training in Kankakee County, Illinois, after the accident, on November 12 and 13, 1999.

The effectiveness of emergency response is affected by the preparations made by local jurisdiction responders and by the railroads involved. Because Amtrak is not able to provide on-site training to every emergency response agency within the territories through which it operates, these agencies often face the prospect of responding to a passenger train emergency without any real knowledge about the particular hazards passenger trains may present. In other words, local emergency responders may not know how to gain access to an overturned locomotive or passenger car, may not know where in cars to search for trapped occupants, and may not be aware of the quantities of diesel fuel available to fuel a fire. As noted above, before this accident, neither the Bourbonnais Fire Protection District nor other Kankakee County emergency responders had been provided on-site instruction or training in responding to such emergencies.

The Braidwood Fire Department officer, who arrived about 50 minutes after the first emergency responder, was familiar with petrochemical fires and recognized almost immediately that a large amount of foam was necessary to combat the blaze. He called for heavy foam tanker trucks to come from a local chemical plant, and a foam tanker arrived and was set up about 1 hour later. Within a few minutes of this equipment beginning to apply foam, the fire was extinguished. Before the arrival of the Braidwood officer, on the other hand, the incident commander had directed firefighting operations that had proved ineffective at either extinguishing the flames or at keeping the fire away from the sleeper car in which occupants were entrapped. The Safety Board concluded that because of insufficient training in responding to railroad emergencies or inadequate/inappropriate resources, or both, the Bourbonnais Fire Protection District was not prepared to respond effectively to a train accident involving a significant diesel fuel fire.

Even though modern locomotives, such as the ones involved in this accident, are designed with improved protection for fuel tanks, the possibility of a fuel leak and fire is present anywhere a major railroad accident occurs. The National Transportation Safety Board therefore has made the following safety recommendation to Amtrak:

In fulfilling your Federal mandate to help prepare emergency responders to respond to an accident involving Amtrak equipment, emphasize to those responders the possibility that such an accident could result in large quantities of burning diesel fuel and urge them to be prepared to respond to this specific hazard. (R-02-3)

The Safety Board also believes that your organizations can play a role in helping to ensure that emergency responders are better prepared for the hazards that may be associated with a railroad accident. The National Transportation Safety Board therefore makes the following safety recommendation to the International Association of Fire Chiefs and the International Association of Fire Fighters:

Inform your membership of the circumstances surrounding this accident and of the need for responders to prepare for train accidents that may result in significant diesel fuel fires. (R-02-4)

The Safety Board also issued safety recommendations to the Department of Transportation, the Federal Railroad Administration, and all class I and regional railroads. In your response to the recommendation in this letter, please refer to Safety Recommendation R-02-4. If you need additional information, you may call (202) 314-6607.

Chairman BLAKEY, Vice Chairman CARMODY, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in this recommendation.

By: Marion C. Blakey
Chairman