Log R-544

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

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Forwarded to:

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SAFETY RECOMMENDATION(S)

R-85-123

At 6:30 a.m., on February 4, 1985, an "empty" placarded railroad tankcar, NATX 9408, containing an estimated 800 gallons of anhydrous hydrogen fluoride, a corrosive liquid, was found leaking in the Consolidated Rail Corporation's Elkhart, Indiana Receiving Yard. During the following 4 hours as local emergency response agencies worked to contain the spill, a vapor cloud formed and traveled approximately 2 1/2 miles affecting nearby residential areas northwest of the yard. A total of 1,500 people within a 1.1-square-mile area adjacent to and northwest of the yard were evacuated for 9 hours as an emergency precaution. Local area hospitals treated 75 persons for minor skin and eye irritations. 1/

NATX 9408 was being transported from Allied Corporation's (Allied) Metropolis Works in Metropolis, Illinois, to Allied's Amherstburg, Ontario, Canada, plant via the Burlington Northern (BN) railroad. NATX 9408 arrived at the BN's Cicero, Illinois, yard on February 3, where it was to be switched to a Consolidated Rail Corporation (Conrail) train. About 7:30 p.m., while the Conrail headend crew was switching out the air repeater car, the front brakeman observed a white vapor cloud around the trucks of NATX 9408. He radioed the engineer and asked him to stop the train's movement. As he approached the tankcar, he detected an acrid odor and was unable to breathe. He left the area and advised the conductor that NATX 9408 was leaking and that it was placarded and stenciled "HYDROGEN FLUORIDE ANHYDROUS." The conductor checked his hazardous materials handbook and advised the head brakeman that hydrogen fluoride is poisonous, corrosive, and acidic and that he should stay away from it. The conductor advised the yardmaster of the situation and the yardmaster told the conductor that the tankcar was listed in the consist as an "empty" and that it could be moved. The front brakeman then resumed switching the air repeater car out of the head portion of the train, which included NATX 9408.

1/ For more detailed information, read Hazardous Materials Accident Report—"Anhydrous Hydrogen Fluoride Release from Tankcar NATX 9408, Train No. BNEL3Y at Conrail's Receiving Yard, Elkhart, Indiana, February 4, 1985" (NTSB/HZM-85-03).

Meanwhile, BN supervisory personnel were directing their attention to routine yard operations. About 7:40 p.m., the yardmaster notified the car foreman about the conductor's report of a possible leak and the need for further inspection. The car foreman said that he would look at the tankcar as soon as an access crossing in the yard was clear. He stated that he had overheard parts of the radio conversations between the head brakeman and the yardmaster and knew that the tankcar was billed as an empty.

Between 8 p.m. and 8:30 p.m., the car foreman inspected the tankcar using a battery-powered lantern. He said that he read the tankcar's stenciling and observed that the tankcar was painted white and equipped with head shields. He said that he first inspected the car from the south side and then crossed over to the west end (A-end) of the car and inspected it from the north side. He said that he looked at the outer jacket (the tankcar was not jacketed), and the underside of the tank, but that he did not look at the top of the tankcar during the inspection. He said that he did not observe any evidence of a leak, which indicated to him that if there had been a leak it apparently had stopped and that he did not discuss with the head brakeman his observations to determine where the cloud was observed originally. After inspecting the tankcar at 8:30 p.m., the car foreman advised the yardmaster that he did not see any evidence of a leak. At 9:25 p.m., NATX 9408 departed Cicero in train BNEL3Y.

BN's railroad yard emergency plan requires supervisory personnel to initiate prompt action to identify a suspected leaking tankcar and to implement precautionary measures. However, based on the testimony of the yard supervisory personnel, it is apparent that they did not consider an empty leaking tankcar, as compared to a loaded leaking tankcar, a serious problem. Upon being notified of the leaking tank car, the yardmaster should have immediately assigned someone to observe the leaking tankcar and to monitor the movement of the vapor cloud, arranged for the most accessible inspector to have immediately inspected the tankcar, and alerted nearby employees of the potential threat. Instead, the yardmaster's treatment of the information as a minor threat from a controlled, venting, empty tankcar, which was in an area of the yard not interfering with routine train operations, resulted in the tankcar not being inspected for almost 1 hour.

The Safety Board is concerned about the adequacy of the inspection practices used by the car foreman and doubts that he adequately inspected the tankcar. The postaccident examination of NATX 9408 revealed that the car foreman's statement that he inspected the outer jacket of the tankcar could not be correct since the tankcar did not have a jacket. Had the car foreman conducted an adequate inspection, it would have revealed that the commodity was removing the paint on the tank car as it contacted the tank shell. Also, when the car foreman's inspection did not confirm the report of the leak, the yardmaster should have required the car foreman to communicate with the train crewmember who had observed the vapor cloud coming from the tankcar. Unfortunately, the yardmaster decided that, since the release of the hazardous material had stopped, it was safe to continue in transportation. Consequently, the leaking tankcar containing a high-risk hazardous material was allowed to proceed 107 miles to Elkhart, where eventually 1,500 persons had to be evacuated.

Initial and recurrent training on mid-level supervisory activities failed to impress upon the yardmaster and the car foreman the need for taking precautions and immediate action in handling potentially lethal leaking hazardous materials. Although the written procedures for responding to initial notification reports appeared to be adequate at the time of the leakage, the supervisors at the yard did not implement those procedures, apparently deciding that the inspection of the leaking tankcar was less urgent than other

routine activities. The failure of the car foreman to don the proper protective equipment required by the nature of the commodity being transported leads the Safety Board to believe that the car foreman did not understand the hazards of the commodity. The fact that the Federal Railroad Administration (FRA) investigator has recommended that a violation report be filed against BN for improper inspection procedures and the car foreman's failure to inspect the dome of the tankcar points to the need for improved tankcar inspection procedures to be emplaced at BN's Cicero railroad yard.

Train BNEL3Y arrived on the outskirts of Elkhart at 12:34 a.m., on February 4; the 107-mile trip was uneventful. No one alongside the track or the traincrew reportedly observed any indication that NATX 9408 was leaking. About 3:15 a.m., the head portion of the train containing the tankcar was pulled into the eastbound lead track of the Conrail receiving yard at Elkhart. While standing on the ground during this movement, the conductor of BNEL3Y noted a white vapor around the B-end platform of the tankcar. At 3:45 a.m., when the head portion of the train containing NATX 9408 was moved into the yard, the conductor delivered the waybill and called the hump yardmaster to advise him that NATX 9408 was leaking and that "the car contained a corrosive, acidic, and that poisonous material and inspection personnel should wear protective equipment."

Around 3:50 a.m., the yardmaster notified the yard's car inspector that a "potentially dangerous" empty hazardous material car was arriving on track R-14, and that the car was "venting" and to avoid inhaling the fumes. The yardmaster did not notify the assistant terminal superintendent of the situation as required by Conrail procedures. However, the car inspector did notify other employees in the receiving yard to avoid the area. The car inspector later said that he considered the yardmaster's notice as a warning and that he believed there was no need to report back to the yardmaster as to the condition of the car or to conduct an inspection at that time. About 5 a.m., the car inspector provided the general car foreman the information furnished by the yardmaster.

At 6:25 a.m., while switching cars at the east end of the receiving yard in the vicinity of receiving yard track R-14, a humpcrew notified the yardmaster of a vapor cloud around a tankcar in that area. At 6:30 a.m., the yardmaster informed the assistant terminal superintendent that a tank car was leaking, and he dispatched the trainmaster and the general car foreman to examine the tankcar. Shortly afterward, the trainmaster and the general car foreman contacted the assistant terminal superintendent and confirmed that NATX 9408 was leaking. At 6:44 a.m., the assistant terminal superintendent advised the Elkhart City Communication Center that there was an empty tankcar in the receiving yard which contained "hydrofluoric acid," that it appeared to be venting fumes which were hanging just above the ground around the car, and that the waybill emergency guide advised "avoid going near without self-contained breathing apparatus, if inhaled it may be fatal." The Elkhart dispatcher requested directions to the tankcar and that someone meet the first responding units.

Conrail's railroad yard emergency plan requires supervisory personnel to initiate prompt action to identify suspected leaking tankcars and to implement precautionary measures. However, despite the conductor's report describing the seriousness of the leakage, the yardmaster failed to take early action to minimize the danger of exposure to the public and railroad personnel. Upon receiving the conductor's report, the yardmaster should have assigned someone immediately to monitor the cloud behavior, arranged for the most accessible inspector to have immediately inspected the tankcar, and alerted nearby personnel of the potential threat. Instead, the yardmaster treated the report

provided by the conductor as indicative of a minor threat from a controlled, venting, empty tankcar which was in an area of the yard not interfering with routine train operations. Consequently, the leaking tankcar went unreported to the city of Elkhart for about 3 1/2 hours, thereby negating the preplanned emergency response. Fortunately, because of the small size of the breach in the tankcar, the release of the hazardous material was minimal. However, even in the case of 800 gallons of anhydrous hydrogen fluoride, any delay in identifying a breached tankcar correspondingly would delay the ability of the community to respond effectively. The railroad did not provide public emergency response personnel in Elkhart with needed, timely information for the determination of the hazards posed to the community by the hazardous material in the breached and partially loaded tankcar. Had the yardmaster effectively used available communication resources, he would have been able to overcome the many uncertainties and inspection delays (3 1/2 hours) during the handling of this emergency.

Conrail conducted a formal hearing and reprimanded the yardmaster for his actions. However, his actions may have been the result of poor training and the lack of motivation by his superiors who may have failed to impress on him the importance of prompt action when dealing with a release of hazardous materials. The training of railroad employees in the performance of duties relating to emergencies involving the release of hazardous materials is paramount in minimizing the effects of hazardous materials releases in railroad yards, especially where the railroad yard is located adjacent to populous areas. The activities at the Cicero and Elkhart yards demonstrated the need for BN and Conrail to immediately intensify their training and testing of employees about the inspection they are to make and the actions they are to take during emergency conditions involving the release of hazardous materials.

As a result of its investigation of this accident, the National Transportation Safety Board recommends that the Consolidated Rail Corporation and the Burlington Northern Railroad Company:

> Review and revise, as necessary, yard procedures for handling tankcars suspected to be leaking to provide adequate precautions to protect operating personnel with railroad yards, and ensure that an immediate identification and inspection is performed when a suspected leaking or venting hazardous materials tankcar is involved. (Class II, Priority Action) (R-85-123)

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 action taken as a result of its safety recommendations. Therefore, it would appreciate a response from you regarding action taken or contemplated with respect to the recommendation in this letter. Please refer to Safety Recommendation R-85-123 in your reply.

BURNETT, Chairman, GOLDMAN, Vice Chairman, and LAUBER, Member, concurred in this recommendation.

By: Jim Burnett
Chairman