



National Transportation Safety Board
Washington, D.C. 20594

Safety Recommendation

Date: MAR 02 2012

In reply refer to: R-12-10

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The National Transportation Safety Board (NTSB) 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 you to take action on the safety recommendation in this letter. The NTSB is vitally interested in this recommendation because it is designed to prevent accidents and save lives.

This recommendation addresses the adequacy of storm water drainage system assessment. The recommendation is derived from the NTSB's investigation of the June 19, 2009, derailment of a Canadian National Railroad Company (CN) freight train in Cherry Valley, Illinois, and is consistent with the evidence we found and the analysis we performed. As a result of this investigation, the NTSB has issued 15 safety recommendations, 1 of which is addressed to your organization. Information supporting this recommendation is discussed below. The NTSB would appreciate a response from you within 90 days addressing the actions you have taken or intend to take to implement our recommendation.

About 8:36 p.m., central daylight time, on Friday, June 19, 2009, eastbound CN freight train U70691-18, traveling at 36 mph, derailed at a highway/rail grade crossing in Cherry Valley, Illinois. The train consisted of 2 locomotives and 114 cars, 19 of which derailed. All of the derailed cars were tank cars carrying denatured fuel ethanol, a flammable liquid. Thirteen of the derailed tank cars were breached or lost product and caught fire. At the time of the derailment,

several motor vehicles were stopped on either side of the grade crossing waiting for the train to pass. As a result of the fire that erupted after the derailment, a passenger in one of the stopped cars was fatally injured, two passengers in the same car received serious injuries, and five occupants of other cars waiting at the highway-rail crossing were injured. Two responding firefighters also sustained minor injuries. The release of ethanol and the resulting fire prompted a mandatory evacuation of about 600 residences within a 1/2-mile radius of the accident site. Monetary damages were estimated to total \$7.9 million.¹

The NTSB determined that the probable cause of the accident was the washout of the track structure that was discovered about 1 hour before the train's arrival, and the CN's failure to notify the train crew of the known washout in time to stop the train because of the inadequacy of the CN's emergency communication procedures. Contributing to the accident was the CN's failure to work with Winnebago County to develop a comprehensive storm water management design to address the previous washouts in 2006 and 2007. Contributing to the severity of the accident was the CN's failure to issue the flash flood warning to the train crew and the inadequate design of the DOT-111 tank cars, which made the cars subject to damage and catastrophic loss of hazardous materials during the derailment.

At the time of the accident, two drainage pipes—a 36-inch pipe under the CN tracks and a 24-inch pipe under Mulford Road—were in place to handle runoff that collected in the area bounded by the UP tracks to the north, the CN tracks to the south, and Mulford Road to the east. According to representatives of the CN and the Winnebago County Highway Department, neither of these pipes was intended to be a primary conveyance for water. Instead, each was to be a relief pipe to provide an escape route once the water level in the swale area bounded by the road and tracks rose to the height of the pipes. On the day of the accident, the water level did rise to the height of the pipes, but the pipes were unable to accommodate the excess water, which allowed the water to back up and overflow the track and the road.

This was not the first time excess water had affected the integrity of the CN tracks at this location. Twice in the previous 3 years, water in the swale area had risen to a level sufficient to remove support from underneath the tracks. In 2006, water rushing across Mulford Road removed ballast from track on both sides of the crossing. Less than a year later, in 2007, water caused a washout area 5 to 6 feet long and about 4 feet deep under the tracks about 40 feet west of the grade crossing. The NTSB concluded that the storm water drainage system in place in the area of the accident was inadequate as evidenced by the washout of the CN tracks on the day of the accident and by previous water damage to the track structure that occurred in 2006 and 2007.

It was in response to the 2007 washout that the CN installed the 36-inch relief pipe. The CN did not attempt to determine why the water had been able to rise to the level that a relief pipe was needed or to evaluate the existing drainage system in light of two water incidents in less than 1 year that had threatened the integrity of its tracks.

¹ See *Derailment of Canadian National Railway Company Freight Train U70691-18 With Subsequent Hazardous Materials Release and Fire, Cherry Valley, Illinois, June 19, 2009*, Railroad Accident Report NTSB/RAR-12/01 (Washington, DC: National Transportation Safety Board, 2012) on the NTSB website at <<http://www.nts.gov>>.

The Winnebago County Highway Department did not take any action in response to the two high water incidents because Mulford Road had not been directly affected. Highway department involvement was limited to observing the installation of the 36-inch pipe to make sure the roadway was not damaged. County officials did not consult with the CN about the sizing of the pipe, nor did the CN and the county attempt to work together to identify the reason for the unexpectedly high water levels.

The NTSB concluded that this accident demonstrates that storm water issues can affect more than one entity—in this case, the CN and Winnebago County—and can require that multiple entities work jointly in a collaborative effort to solve any underlying defects or inadequacies. The NTSB therefore has issued the following safety recommendations to the U.S. Department of Transportation:

Develop a comprehensive storm water drainage assessment program to be conducted jointly by railroads and public entities that ensures the adequate flow of water under both railroad and highway facilities, and require railroads and public entities to coordinate any changes to storm water drainage systems before their implementation. (R-12-1)

Notify railroads and public entities about the circumstances of this accident and the importance of exchanging information related to storm water drainage system design issues that may adversely affect the adequate flow of water under both railroad and highway facilities. (R-12-2)

After the accident, the CN installed two new 48-inch-diameter cast iron pipes at the site of the previous 36-inch pipe. The CN also replaced the existing 24-inch relief pipe under Mulford Road with a new 48-inch-diameter pipe, a new 36-inch-diameter pipe, and a new 24-inch-diameter pipe, all supplied by Winnebago County. The new pipes significantly increased the drainage capacity for the area in which the high water occurred that precipitated this accident, but an opportunity was missed, in that similar steps could have been taken in the wake of previous instances of high water.

Therefore, the National Transportation Safety Board makes the following safety recommendation to the American Association of State Highway and Transportation Officials, to the National Association of County Engineers, to the American Public Works Association, and to the Institute of Transportation Engineers:

Inform your members about the circumstances of this accident and the importance of exchanging information related to storm water drainage system design issues that may adversely affect the adequate flow of water under both railroad and highway facilities. (R-12-10)

The NTSB also issued safety recommendations to the U.S. Department of Transportation, to the Federal Railroad Administration, to the Pipeline and Hazardous Materials Safety Administration, to the National League of Cities, to the National Association of Counties, to the Association of State Dam Safety Officials, to the National Association of Towns and Townships, to the U.S. Conference of Mayors, and to the Canadian National Railway Company. The NTSB

also reiterated previously issued safety recommendations to the Federal Railroad Administration and the Pipeline and Hazardous Materials Safety Administration.

In response to the recommendation in this letter, please refer to Safety Recommendation R-12-10. We encourage you to submit updates electronically at the following e-mail address: correspondence@ntsb.gov. If a response includes attachments that exceed 5 megabytes, please e-mail us at the same address for instructions. To avoid confusion, please do not submit both an electronic copy and a hard copy of the same response.

Chairman HERSMAN, Vice Chairman HART, and Members SUMWALT, ROSEKIND, and WEENER concurred in this recommendation.



By: Deborah A.P. Hersman
Chairman