National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: March 2, 2012

In reply refer to: R-12-12 through -15

Mr. Claude Mongeau
President and Chief Executive Officer
Canadian National Railway Company
935 de La Gauchetière Street West
Montreal, Quebec, H3B 2M9
Canada

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 recommendations in this letter. The NTSB is vitally interested in these recommendations because they are designed to prevent accidents and save lives.

These recommendations are 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 are consistent with the evidence we found and the analysis we performed. As a result of this investigation, the NTSB has issued 15 safety recommendations, 4 of which are addressed to the CN. Information supporting these recommendations 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 recommendations.

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.

CN Emergency Communications

The accident occurred as the train was traversing the South Mulford Road (referred to hereinafter as Mulford Road) grade crossing in Cherry Valley, Illinois. About 1 hour before the accident, several citizens in the vicinity of the grade crossing noted that high water conditions were affecting the tracks and notified authorities. One of the first citizens to note the washout condition was an individual with experience in transporting hazardous materials. He said he was aware that railroads normally posted their contact information at all grade crossings but that he could not find the contact information at the Mulford Road crossing. When he could not locate the contact information, he called Winnebago County 911 and stated, "Well, anyway, underneath the tracks is washed out, so if a train goes over there, it is going to derail." Over the next few minutes, the 911 center received several other calls reporting that the track near the Mulford Road crossing was washed out or was "washing away." This 911 call was made about 56 minutes before the accident.

According to the CN, the emergency contact information for the Mulford Road crossing had at one time been posted on the signal bungalow. When the bungalow was replaced as part of a crossing upgrade, the emergency contact information was not reposted. Had the emergency contact information been available, one of the first calls about the washout would likely have been to the CN instead of, or in addition to, 911. Even though the 911 center was able to identify the crossing, it was not until 41 minutes after the initial 911 call that the CN Police Emergency Call Center in Montreal was notified of the track washout. The absence of emergency contact information at the crossing thus caused a delay in reporting the track conditions, which decreased the time available to notify rail traffic controllers (RTC) and to stop any trains approaching the washout area. The NTSB therefore concluded that had the required CN grade crossing identification and emergency contact information been posted at the Mulford Road crossing, the railroad would likely have been notified of the track washout earlier, and the additional time may have been sufficient for the RTC to issue instructions to stop the train and prevent the accident. Therefore, the NTSB recommends that the CN implement a process, consistent with the

[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.ntsb.gov>.

principles of a safety management system, to ensure accuracy and visibility of emergency contact information at all highway/rail grade crossings on its system.

Although the CN Police Emergency Call Center was not notified of the washout as soon as it should have been, it did receive notification of the track washout at 8:16 p.m., almost 20 minutes before the arrival at the crossing of the accident train. Despite this advance warning, emergency call desk personnel were unable to establish contact with dispatchers at the CN Homewood center in time to prevent the accident.

Emergency call center personnel spent the first few minutes after the initial notification attempting to identify the crossing so that the appropriate RTC could be notified. After the crossing was located, several additional minutes elapsed before the first attempt was made to contact the RTC. At 8:23 p.m., a police call desk officer made the first call to the RTC at Homewood. When the first calls did not go through because the lines were busy, a second caller was enlisted to try to reach the RTC while the first caller attempted to contact the chief dispatcher overseeing the RTC.

The two call desk officers each made three unsuccessful calls before the chief dispatcher and the RTC were finally contacted at 8:40 p.m. Even then, the officer speaking with the RTC initially gave a muddled and incomplete report, saying "apparently we've got some flooding in the Rockfield [*sic*], Illinois, area. The location was subsequently clarified (although neither "washout" nor Mulford Road was mentioned), but by then it was too late as the derailment had already occurred.

At no point did emergency call officers attempt to use the dedicated police "hotline," that was routed directly to the desk of the chief dispatcher and that was supposed to be monitored around the clock. The CN police stated that they had experienced difficulty getting access to the hotline in the past and that, even when calls were made using the hotline, if the chief dispatcher had a heavy workload at the time, the ringing hotline phone would often be ignored.

The inability of emergency call center officers to make telephone contact with either the chief dispatcher or the RTC indicates a breakdown in the policies, procedures, and equipment on which the CN relied for emergency communication. For example, the telephone equipment used in the dispatch center did not have a rollover feature so that incoming calls could be answered efficiently if the RTC was working with trains or with workers involved other activities. Often, the phone would just ring, or it would be picked up and laid down until the desk personnel finished their current work tasks. By failing to provide and reserve a dedicated line of communication that was used for emergency purposes only and that took precedence over any other communication, the CN created an environment in which emergency communication with life-saving implications could be—and in this accident were—subordinated to routine operational communications. The NTSB concluded that the CN police emergency communication system in place at the time of this accident was inadequate, with the result that CN police were unable to prevent the derailment even though adequate time was available for them to have done so.

Since the accident, the CN has updated its emergency communication system policies, procedures, and equipment. The CN offices in Canada have been provided with hotline phone

numbers for the 12 RTC desks in the Homewood center. If a call to one of the hotline numbers is not answered within 7 seconds, it will roll over to an emergency line. If that line is not answered within 7 seconds, it will roll over to a back-up emergency line. Additionally, direct telephone lines were assigned to each RTC/signal desk at the Homewood, Montreal, Toronto, and Edmonton centers, and calls on these lines take priority. A red light flashes when a call is being received. The new procedures and the equipment upgrades are designed to prevent a recurrence of the breakdown in communication that occurred on the day of this accident. However, policies, procedures, and safety devices are effective only if the procedures are followed and if the devices are actually used and are regularly tested for proper function. The NTSB therefore recommends that the CN implement a program consistent with principles of safety management systems to periodically test all aspects of its internal emergency communication system to ensure that personnel are familiar with the system's operation and that emergency notifications can be communicated immediately to any chief dispatcher or RTC in the CN system.

Postaccident Drug and Alcohol Testing

After the accident, CN identified two employees—the conductor and the engineer of the accident train—for postaccident toxicological testing pursuant to Title 49 *Code of Federal Regulations* (CFR) 219.203 ("Responsibilities of railroads and employees"). As mentioned in section 219.203(a), "Employees tested,"

> Following each accident and incident described in 49 CFR 219.201, the railroad (or railroads) must take all practicable steps to assure that all covered employees of the railroad directly involved in the accident or incident provide blood and urine specimens for toxicological testing by FRA.

In addition, 49 CFR 219.203(2) states,

> Such employees must specifically include each and every operating employee assigned as a crew member of any train involved in the accident or incident. In any case where an operator, dispatcher, signal maintainer or other covered employee is directly and contemporaneously involved in the circumstances of the accident/incident, those employees must also be required to provide specimens.

The CN initially determined that the RTC would not be required to undergo postaccident toxicological testing because he was not believed to have been directly involved in the accident. As a result, the RTC was allowed to go off duty without being tested for drugs or alcohol. The NTSB, however, does not believe that the CN appropriately followed 49 CFR 219.203(4), which states that, "Covered employees who may be subject to testing under this subpart must be retained in duty status for the period necessary to make the determinations required by 49 CFR 219.201." Specifically, the NTSB does not believe that the CN had sufficient information about the circumstances of the accident before the end of the RTC's shift to make that determination.

The next day, as the CN continued to investigate the accident, company officials realized that the RTC may have been directly involved in the accident. However, the CN mistakenly believed that the RTC could no longer be required to provide specimens for testing. Federal regulations state that an employee may be immediately recalled for testing if (per 49 CFR 219.203(b)(4)(ii)), "the railroad's preliminary investigation (contemporaneous with the

determination required by 49 CFR 219.201) indicates a clear probability that the employee played a major role in the cause or severity of the accident/incident."

Because the RTC had not undergone required postaccident toxicological testing, it could not be determined if drugs or alcohol were a factor in his performance. Moreover, the NTSB is concerned that the CN did not follow regulations requiring that it keep the RTC in on duty status long enough to make an accurate determination regarding his role in the accident and that it apparently did not understand its responsibility to conduct postaccident toxicological testing even if the RTC had gone off duty. The NTSB concluded that the failure of the CN to conduct postaccident toxicological testing on the RTC demonstrates that the CN postaccident toxicological program was ineffective. Therefore, the NTSB recommends that the CN examine and revise its postaccident toxicological testing program to ensure that RTCs are tested unless there is clear and convincing evidence that they were not involved in the accident.

Weather Alert Policies and Rule X

In this accident, because the RTC did not convey the flash flood warning to the accident train, Rule X was not invoked by the train crew. As a result, the effect of its implementation on this accident can never be known. One reason for the difficulty in making such an assessment is the vagueness of Rule X. For example, the rule states that in the case of a flash flood warning, the train is to be operated at a speed that will allow it to be stopped short of an obstruction. The speed or the type of obstruction that might be expected is not specified. The problem with this lack of specificity is that a speed that would allow a train to stop short of a readily visible obstruction such as a tree over the tracks or a rockslide would probably be too fast for the train crew to see and respond to an impediment such as high water, a track washout, or misaligned rail—the types of hazards most likely to occur as a result of a flash flood.

It is not clear what information the RTC would have provided to the train crew if he had, in fact, informed them of the alert. He might have read the warning to the conductor as written, including the advisory to "Watch out for water on the tracks and possible washouts," but because a verbatim reading of the alert was not required by CN policy, the crew may not have been alerted to the specific hazards.

Weather alerts and their effects on train speeds were also addressed in a July 16, 2008, CN weather alert policy that instructed RTCs, after learning of warnings of flash flooding, to contact track personnel in the area to inspect the track before passage of a train. The policy directed RTCs to inform train crews of flash flood warnings and to advise them to operate their trains at a speed, "prepared to stop within one half the range of vision, until the track is inspected or the Track Supervisor has given verbal permission to resume normal operation."

Presumably, if no track inspector were immediately available to inspect the track, trains would continue to operate at the lower speed until an inspector could be dispatched. However, a track washout, which is a common hazard during flash flooding, is extremely difficult to detect from a locomotive cab, even when the train is traveling at a reduced speed, and especially when that speed is determined by the crew based on their estimate of the train's stopping distance. Thus, a train crew, using its own discretion to determine an appropriate speed, may not be able to prevent an accident involving high water or a washout.

The RTC also did not notify a track inspector in response to the flash flood warning. A track inspector was dispatched by the Edmonton Walker Call Desk in response to the RTC's relaying the accident train's report of high water, but the RTC's report was made even as the train was derailing, and the track inspector would not be en route until about 20 minutes later.

The NTSB concluded that the CN's weather policies and rules in effect at the time of the accident were inadequate because they provided insufficient and vague guidance in not requiring RTCs to read weather alerts verbatim to train crews; did not clearly specify whether train crews should operate trains at a restricted speed after receiving an alert; provided no notification requirement that track inspectors conduct severe weather related inspections prior to train operations; and did not consolidate weather alert notices and the appropriate operation of trains into a single rule. The NTSB therefore recommends that the CN modify its weather warning operating and safety rules and procedures to (1) consolidate weather policies in a single rule, accessible to all operating personnel, (2) require that RTCs promptly and precisely notify affected train crews of weather alerts and identify for train crews the specific hazards to train operation represented by a weather alert, and (3) require either that a track inspector inspect the affected track before train operations are permitted within an affected weather alert area or that engineers operate their trains at restricted speed and crews watch for water on tracks, possible washouts, and misaligned track in the affected areas until the track is inspected.

Therefore, the National Transportation Safety Board makes the following safety recommendations to the Canadian National Railway Company:

> Implement a process, consistent with the principles of a safety management system, to ensure accuracy and visibility of emergency contact information at all highway/rail grade crossings on your system. (R-12-12)
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> Implement a program consistent with principles of safety management systems to periodically test all aspects of your internal emergency communication system to ensure that personnel are familiar with the system's operation and that emergency notifications can be communicated immediately to any chief dispatcher or rail traffic controller in your system. (R-12-13)
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> Examine and revise your postaccident toxicological testing program to ensure that rail traffic controllers are tested unless there is clear and convincing evidence that they were not involved in the accident. (R-12-14)
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> Modify your weather warning operating and safety rules and procedures to (1) consolidate weather policies in a single rule, accessible to all operating personnel, (2) require that rail traffic controllers promptly and precisely notify affected train crews of weather alerts and identify for train crews the specific hazards to train operation represented by a weather alert, and (3) require either that a track inspector inspect the affected track before train operations are permitted within an affected weather alert area or that engineers operate their trains at restricted speed and crews watch for water on tracks, possible washouts, and misaligned track in the affected areas until the track is inspected. (R-12-15)

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 Association of American Railroads, to the American Association of State Highway and Transportation Officials, to the National Association of Country Engineers, to the American Public Works Association, to the Institute of Transportation Engineers, 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, and to the U.S. Conference of Mayors. 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 recommendations in this letter, please refer to Safety Recommendations R-12-12 through -15. 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 these recommendations.

[Original Signed]

By: Deborah A.P. Hersman
Chairman