

Log R-448

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: August 12, 1983

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Forwarded to:

Honorable Howard Dugoff  
Administrator  
Research and Special Programs  
Administration  
400 7th Street, S.W.  
Washington, D.C. 20590  
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SAFETY RECOMMENDATION(S)

R-83-90

About 5:12 a.m., c.d.t., on September 28, 1982, Illinois Central Gulf Railroad (ICG) freight train Extra 9629 East (GS-2-28) derailed 43 cars on the single main track of the Hammond District in Livingston, Louisiana. Of the derailed cars, 36 were tank cars; 27 of these cars contained various regulated hazardous or toxic chemical commodities, 2 contained nonregulated hazardous materials, and 5 contained flammable petroleum products. A total of 20 tank cars were punctured or breached in the derailment. Fires broke out in the wreckage, and smoke and toxic gases were released into the atmosphere. Thermally-induced explosions of two tank cars that had not been punctured caused them to rocket violently. About 3,000 persons living within a 5-mile radius of the derailment site were evacuated for as long as 2 weeks. Nineteen residences and other buildings in Livingston were destroyed or severely damaged. More than 200,000 gallons of toxic chemical product were spilled and absorbed into the ground, requiring extensive excavation of contaminated soil and its transportation to a distant dump site. This has resulted in long-term closure of the railroad line and an adjacent highway. Property damage has been estimated to be in excess of \$14 million. 1/

About 2 weeks following the derailment, after wrecking and clearing operations had been started by ICG and the residents of Livingston were allowed to return to their homes, the Louisiana Department of Natural Resources (DNR) detected perchloroethylene in concentrations of 25 parts per million (ppm) in the soil at the derailment site. More than 20,000 gallons of perchloroethylene, or tetrachloroethylene, a concentrated cleaning solvent, were released into the soil environment from a tank car that sustained shell punctures and bottom outlet damage in the derailment. Characteristically, perchloroethylene does not readily bind to the soil and tends to move rapidly through the soil strata. The DNR also discovered that the chemical had migrated well beyond the location where it had been spilled. Facilitating this migration was the spreading of the contaminated soil over the general derailment area by bulldozers. Heavy rains and flooding, particularly during April 1983, have since aggravated the problem with the contaminated area now encompassing about 10 acres along and on both sides of the railroad and Highway 190.

1/ For more detailed information, read Railroad Accident Report—"Derailment of Illinois Central Gulf Railroad Freight Train Extra 9629 East (GS-2-28) and Release of Hazardous Materials at Livingston, Louisiana, September 28, 1982" (NTSB-~~RA 83-06~~).

RAA-83-5

Most of Livingston's drinking water is obtained from wells tapping a deep aquifer, but there are a number of shallow wells in the area, and DNR decided that precautions needed to be taken to prevent the contamination of ground water by perchloroethylene. DNR established 0.3 ppm of perchloroethylene as its criteria for maximum safe level of contamination by the chemical. Excavation of the release site was begun in October 1982, with 35,000 cubic yards of contaminated soil being removed from a pit 22 feet deep, 65 feet wide, and 120 feet long. More than 25,000 cubic yards of soil have since been excavated from two additional pits, and it has been estimated that ultimately it will be necessary to remove an additional 40,000 cubic yards of soil contaminated by perchloroethylene.

Reportedly, perchloroethylene has been in production for about 15 years, and in 1981 was nominated for cytogenic and carcinogenic testing in the National Toxicological Plan on the basis of animal test data. It is not regulated by the Department of Transportation's Materials Transportation Bureau (MTB) as a hazardous substance, and the tank car carrying the chemical was not required to be placarded. The shipment's waybill did not include any product or emergency response information. The Safety Board has learned that the Environmental Protection Agency (EPA) has completed toxicological testing of perchloroethylene and will issue a notice of proposed rulemaking to establish a minimum spill quantity for required reporting purposes. The Safety Board has also been informed that MTB will assign a hazardous materials classification to perchloroethylene for transportation purposes, if and when EPA issues a final rule.


The Safety Board believes that unfortunately perchloroethylene is only one of many chemicals which are not regulated and the release of which may pose serious public health considerations. On the basis of what has been learned at Livingston, there should be no further delay on the part of MTB in classifying perchloroethylene as hazardous and requiring its transportation in tank cars which have tank head protection and do not have vulnerably exposed bottom outlets. Other chemicals which pose a hazard to public health also should be identified and regulated without delay.

The need for MTB to respond to the lessons of the Livingston accident and to take appropriate action is evidenced by a second perchloroethylene spill in Louisiana. On April 20, 1983, a bottom outlet extension on a tank car containing the chemical was damaged as the car was moving in a Southern Pacific Transportation Company (SP) train through the city of Lake Charles. Approximately 8,000 gallons of the chemical was released before the leak could be contained. Although the SP personnel immediately involved knew nothing of the toxicity of perchloroethylene, they did notify the shipper and the Louisiana DNR. Dikes were built to contain the spill, but in 3 days the chemical had penetrated to a depth of 11 feet. As a result, the DNR has ordered excavation of the contaminated soil as it did at Livingston.

Therefore, the National Transportation Safety Board recommends that the Research and Special Programs Administration:

Require the Materials Transportation Bureau to identify commodities such as perchloroethylene which may pose a serious long-term threat to local environments, and to take timely action to regulate their transportation. (Class I, Urgent Action) (R-83-90)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and McADAMS, BURSLEY, and ENGEN, Members, concurred in this recommendation.

  
By: Jim Burnett  
Chairman