

LOG I-50 A14

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

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ISSUED: September 30, 1981

Forwarded to:

Mr. William Dempsey
President
Association of American Railroads
1920 L Street, N.W.
Washington, D.C. 20036

SAFETY RECOMMENDATION(S)

I-81-7

About 12:45 a.m., eastern standard time, on July 27, 1981, two loaded, free rolling tank cars were humped in tandem in Conrail's Oak Island Yard in Newark, New Jersey, to be coupled with a standing empty tank car. As the empty tank car was driven forward, its coupler overrode the coupler and struck the head of a standing tank car loaded with 24,700 gallons of ethylene oxide. ^{1/} The impact resulted in a 1.25-inch by 0.125-inch breach near the bottom of the tank head of the loaded car. Ethylene oxide escaped through the breach and ignited. The resultant fire burned for 40 hours and was not extinguished until 5:30 p.m. July 28.

Because of the possibility that the burning tank could explode, local authorities ordered the evacuation of the area within a 1-mile radius of the tank car. Several hundred workers at companies near the Oak Island Yard were ordered to leave their jobs; some air traffic at Newark International Airport was delayed; and a hotel, part of the airport north terminal area, and the New Jersey marine terminal were evacuated. A 4-mile section of Routes 1 and 9 and the Pulaski Skyway leading to the Holland Tunnel were closed until the fire was out.

Although the Safety Board's investigation of the accident is continuing, it has disclosed that neither the empty tank car (DOT Specification 111A100W1) nor the ethylene oxide tank car (DOT Specification 111A100W4) had been equipped with top and bottom shelf couplers (coupler vertical restraint system). Had they been, the ethylene oxide tank car puncture and material release probably would have been prevented.

1/ Ethylene oxide is a material that can become violently unstable if heated or contaminated with alkalai metals, numerous other chemicals, and water. The National Fire Protection Association has assigned its highest flammability rating and its second highest reactivity rating to this product. Emergency information available at the scene recommended that in the event of a fire all persons within a radius of 5,000 feet should be evacuated.

Ethylene oxide has been involved in accidents in the past. On January 1, 1968, in Dunreith, Indiana, a derailed ethylene oxide tank car engulfed in fire started venting and exploded within 45 minutes, injuring five emergency response personnel. 2/ In 1973, contamination with water reportedly caused the contents of an ethylene oxide car to explode on an industry siding in Texas and caused an estimated \$3 million in property damage. 3/ The Safety Board is aware of at least four other ethylene oxide tank cars which have exploded since 1964 as a result of accidents .

Currently, ethylene oxide may be transported in either DOT111A100W4 or DOT105A100W cars. Effective January 19, 1981, 49 CFR 173.31 (a) (6) was amended to require 18,000 DOT105A tank cars, including about 1,000 cars in ethylene oxide service to be retrofitted with top and bottom shelf couplers by February 28, 1982. 4/ On the same date, MTB also required 73,000 other DOT Specification tank cars, including over 300 DOT111 tank cars in ethylene oxide service, to be retrofitted within the next 3 1/2 years, by February 28, 1985. Because of the different levels in safety afforded by the 300 unretrofitted DOT111 tank cars between March 1982 and March 1985, the Safety Board is urging that all such tank cars be retrofitted by March 1982.

The Safety Board's investigation has also disclosed that special hump yard humping procedures were not required by regulation and none were in effect at the Oak Island yard for unretrofitted DOT111 or 105 tank cars transporting ethylene oxide and other hazardous materials that can cause large losses if released. Special hump yard handling regulations were established by Federal Railroad Administration's DOT Emergency Order No. 5 in 1974 for DOT112/114 flammable gas tank cars without tank head protection because of the large losses which had occurred. 5/ These cars were not involved in any serious yard accidents after the railroads implemented these special handling procedures. The Newark accident illustrates that special interim hump yard procedures are needed for handling tank cars carrying hazardous materials without coupler vertical restraint systems until these tank cars can be retrofitted. These special procedures should be used for handling cars transporting those hazardous materials for which the 1980 DOT Emergency Response Guidebook or Bureau of Explosives Pamphlet No. 2 recommend 1/2-mile or greater evacuation or isolation distances in the event of release or exposure to fire.

2/ "Railroad Accident Report -- Pennsylvania Railroad Train PR-11A, Extra 2210 West and Train SW-6, Extra 2217 East, Derailment and Collision, Dunreith, Indiana, January 1, 1968."

3/ Fire Command "Tank Car Explosion," National Fire Protection Association, October 1974.

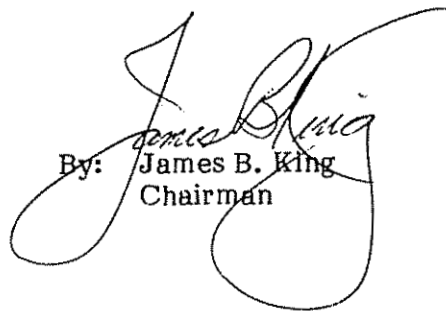
4/ Research and Special Program Administration, Final Rule, Docket No. HM-174, "Shippers: Specifications for Tank Cars," 46 FR 8005, January 26, 1981.

5/ "Railroad Accident Report: Hazardous Materials Railroad Accident in the Alton and Southern Gateway Yard in East St. Louis, Illinois, January 22, 1972," (NTSB-RAR-73-1); "Railroad Accident Report: Hazardous Materials Accident at the Southern Pacific Transportation Company's Englewood Yard, Houston, Texas, September 21, 1974" (NTSB-RAR-75-7); and "Railroad Accident Report: Hazardous Materials Accident in the Railroad Yard of the Norfolk and Western Railroad Railway at Decatur, Illinois, July 19, 1974," (NTSB-RAR-75-4)

Therefore, the National Transportation Safety Board recommends that the Association of American Railroads:

Develop special hump yard procedures for handling tank cars without top and bottom shelf couplers when loaded with hazardous materials for which the 1980 DOT Emergency Response Guidebook or Bureau of Explosives Pamphlet 2 recommends 1/2-mile or greater evacuation or isolation distances in the event of a release or exposure to fire, and help member railroads implement these procedures. (Class I, Urgent Action) (I-81-7)

KING, Chairman, DRIVER, Vice Chairman, GOLDMAN, and BURSLEY, Members, concurred in this recommendation. McADAMS, Member, did not participate.


By: James B. King
Chairman