

SP-20

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

Log I-79

ISSUED: May 16, 1985

Forwarded to:

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SAFETY RECOMMENDATION(S)

I-85-12

About 1:30 p.m., e.s.t., on March 6, 1984, orange vapors began escaping from an MC-307/312 cargo tank containing 3,200 gallons of mixed hazardous waste acids while it was parked at a truck dealership in Orange County, Florida. The volume of vapors increased as the acids rapidly corroded the cargo tank's stainless steel shell. At 5:39 p.m., the acids penetrated the cargo tank's shell and flowed onto the ground. About 250 persons were evacuated from a 3-square-mile area. Twelve persons who came in contact with the released vapors were injured, four seriously. The cargo tank was destroyed. 1/

Hazardous wastes often are combinations of several hazardous materials which have been contaminated during diverse manufacturing processes. General information is not available on the reaction of these highly varied hazardous wastes with transportation packagings or linings. It is imperative, therefore, that shippers and carriers determine the unique hazards posed by the wastes before the materials are transported.

The Department of Transportation (DOT) has assigned responsibility to the shipper for determining proper packaging of hazardous materials throughout various parts of the regulations (49 CFR 171.2, 171.3, 172.101, 173.3, 173.21, and 173.24). On April 3, 1983, DOT published interpretative material in the Federal Register (48 FR 15127-8) "to enhance the safe transportation of hazardous materials in cargo tanks," and because, as a DOT witness testified during the public hearing of the investigation, "there was some misunderstanding in the shipping community as far as their responsibilities were concerned for the selection of the proper vessel and identification of the proper vessel." Therein, DOT undertook to explain to shippers of hazardous materials the responsibilities assigned to them in the regulations (49 CFR 173.22 and 173.24) and to advise shippers of their responsibility to assess the compatibility of their products with materials used in the construction of cargo tanks and of the need to examine their operating practices relative to offering hazardous materials for shipment in cargo tanks to assure they were in compliance with the regulations.

1/ For more detailed information, read Hazardous Materials Investigation Report--"Release of Hazardous Waste Acid from Cargo Tank Truck, Orange County, Florida, March 6, 1984" (NTSB/HZM-85/01).

Harris Corporation (Harris) did not determine before loading whether the waste acids shipped on the day of the accident could be transported safely in an unlined stainless steel cargo tank. Harris employees testified that they believed it was the carrier's, not the shipper's, responsibility to assure compatibility of the cargo tank with the material shipped. However, under the regulations, Harris had a responsibility to determine: that the waste acids could be safely transported in the selected containers, or alternatively that the waste acids should be neutralized or inhibited for transportation; that the mixtures of waste acids in the storage tanks were stable before they were loaded into the cargo tank; that combining the mixtures of waste acids from the two storage tanks would not cause a reaction which would affect the integrity of the cargo tank; and that adding water to the cargo tank loaded with the waste acids would not create a reaction that could affect the integrity of the cargo tank.

Although it is difficult to determine how many factors or conditions influenced the reaction which occurred on March 6, 1984, several contributed to the severity and rapidity of the reaction. The presence of a higher concentration of hydrochloric acid than listed on either waste profile sheet 62810 or 15222 and the presence of nitric acid which may have combined with hydrochloric acid to form aqua regia contributed to the severity of the corrosive reaction. Temperature increases from both the reaction of the waste acids with the cargo tank shell and radiant heat while the cargo tank was parked in direct sunlight probably increased the rate of reaction significantly. The unlined cargo tank previously had been used to transport hydraulic oil, and it had been washed out only with water before leaving the Emelle, Alabama, facility. Although the shipment of hazardous material contained nitric acid which will react with organic material (hydraulic oil), it is considered unlikely that any reaction of nitric acid in the 3,200 gallons of waste acid with the 3 to 4 gallons of hydraulic oil and water residue contributed to the rapid corrosion of the cargo tank.

Harris was responsible for determining the compatibility of the packaging with the hazardous waste shipped on March 6, 1984; however, it relied upon Chemical Waste Management (CWM) to select the proper cargo tank. This being the case, Harris should have provided CWM with a detailed analysis that accurately identified the composition of the mixtures in each of the two storage tanks, but it did not. Harris' operating procedures require that waste materials be analyzed before they are shipped. Harris employees testified, however, that while samples of waste acids were analyzed before they were shipped to acid recyclers to determine the percentage of acids in the mixtures, shipments to waste disposal facilities generally were not analyzed. Harris' analyses of waste acid shipments to recyclers were conducted to determine the composition of the materials for recycling purposes. Therefore, it is likely that had Harris analyzed the waste acids shipped on March 6, 1984, to determine the composition of the mixture, the analysis would not have been used by Harris to assess compatibility with packaging materials. However, had Harris provided CWM an accurate waste profile sheet or other analysis before ordering the cargo tank, and identified the shipment to that analysis when ordering the cargo tank, CWM would have had an opportunity to analyze packaging requirements and might have selected a different cargo tank.

At the time the Harris hazardous waste coordinator ordered the cargo tank, he did not provide the CWM dispatcher with a waste profile number to identify the hazardous waste to be picked up on March 6, and the CWM dispatcher did not request a waste profile number. The CWM dispatcher incorrectly assumed that the hazardous waste was hydrofluoric acid solution (waste profile number 15222) since that was the only waste material that CWM previously had transported for Harris in cargo tanks. Had Harris provided CWM the waste profile number (62810), the CWM dispatcher at least would have been alerted that the material being shipped was not the same material that CWM previously had transported in cargo tanks.

Because CWM's operations in Emelle center around the treatment, storage, and disposal of hazardous wastes, transportation personnel have access to detailed information (including the services of chemists) to help them understand the characteristics and hazards of shipments that other motor carriers normally do not. If CWM had had an accurate description of the material on file, and the shipment had been identified properly when the cargo tank was ordered, it is unlikely that CWM would have selected an unlined cargo tank because of the hydrochloric acid content in the waste material. Therefore, it is as imperative that CWM train personnel involved in the assignment of equipment to positively identify the materials to be transported and to assure that an accurate analysis of packaging requirements is performed before a packaging is selected, as it is that Harris has discharged its responsibility appropriately.

CWM had yet another opportunity to learn that Harris intended to load a material different from that which CWM expected to transport. The CWM dispatcher gave the driver written instructions that told him where to pick up the load and who to contact at the shipper's facility, but the dispatcher did not advise the driver of the specific waste stream to load. Had the driver known the waste profile number (15222) of the material he was expected to pick up, he could have determined before loading that the shipper intended to load a different waste stream (62810) than the dispatcher had intended to be loaded. The driver then would have had an opportunity to seek help from the CWM office to identify the composition of the material that Harris intended to ship before it was loaded. Therefore, since the driver can afford a motor carrier a final opportunity to assure that only waste material which the carrier expects to be loaded into the cargo tank actually is, the Safety Board believes that drivers should be trained to verify the identification of those materials at the shipper's facility before loading operations begin.

Although Chemical Waste Management is not a member of the National Tank Truck Carriers, Inc., as a result of its investigation, the National Transportation Safety Board recommends that the National Tank Truck Carriers, Inc.:

Inform its members of the circumstances of the March 6, 1984, hazardous material accident in Orange County, Florida, and urge them, in light of the potential lack of compatibility of hazardous wastes with the materials used in the construction of cargo tanks, to require that vital information necessary for the safe transportation of hazardous waste is obtained from the shipper before equipment, such as a cargo tank, is dispatched and that drivers are given necessary information and instructions to confirm that the hazardous waste corresponds with the shipping order, and that proper loading procedures are followed.  
(Class II, Priority Action) (H-85-12)

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

By:   
Jim Burnett  
Chairman