SP-20

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

Ray I-81

ISSUED: May 16, 1985

Forwarded to:

Mr. J. T. Hartley
President
Harris Corporation
Melbourne, Florida 32919

SAFETY RECOMMENDATION(S)

I-85-2 through -4

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 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.

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.

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).

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 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, Alabama, 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.

Department of Transportation (DOT) regulations require a shipper to enter on a shipping paper a shipping description of a hazardous material which includes a proper shipping name for the material prescribed by the regulations, which most appropriately describes the material. DOT's Office of Hazardous Materials Regulations (within the Materials Transportation Bureau) determined, in response to inquiry by the Safety Board that the proper shipping name for a mixture of hazardous waste acids similar to the composition of the mixture shipped on March 6, 1984, is "waste, acid liquid, N.O.S." Title 49 CFR 172.202 authorizes but does not require the shipper to enter technical and chemical group names on shipping papers as part of the description for hazardous materials. The director of environmental services admitted that he was not familiar with the DOT rules for shipping hazardous materials and that he did not understand that as the shipper he had a responsibility for insuring that a shipping container (cargo tank) was compatible with the material to be shipped by Harris.

The Orange County Fire Department (OCFD) experienced great difficulty in determining the composition and hazards of the waste involved in the shipment. Fire department personnel arrived on scene at 3:02 p.m. and immediately began evacuating areas engulfed by the acid vapor cloud. The description of the material on the shipping paper (waste, acid liquid, NOS) obtained from the driver about 3:30 p.m., was too general to help the OCFD effectively mitigate the circumstances. Because the OCFD could not get quick, accurate information about the composition of the hazardous waste acids from either the shipper or the carrier, it could not determine the type of cargo tank to be used to safely transfer the load or take other measures to neutralize the cargo. As a result, the acid continued to corrode the cargo tank unchecked.

Harris did not provide an accurate description of the material to the OCFD until nearly 4 1/2 hours after it arrived on scene. At that time, however, the OCFD had no reason to believe the description was any more accurate then several conflicting reports that it had received earlier from both Harris and CWM. Moreover, by then, hazardous wastes had penetrated the cargo tank and had begun flowing onto the ground. An accurate description of the materials transported and the hazards they present is essential to help emergency response personnel make proper decisions to protect the public and to minimize damage to property and the environment.

Therefore, as a result of its investigation, the National Transportation Safety Board recommends that the Harris Corporation:

> Establish procedures to determine safe and proper packagings for all shipments of hazardous waste which assure that the materials shipped are compatible with the materials of construction of the packaging during transportation. (Class II, Priority Action) (I-85-2)
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> Revise operational procedures for shipping hazardous waste to assure compliance with Department of Transportation regulations. (Class II, Priority Action) (I-85-3)
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> Enter information on shipping papers to better inform emergency response personnel about the composition and hazards of the waste material being shipped, as permited by Title 49 CFR 172.202, and include action that can be taken to neutralize the material and mitigate its hazards. (Class II, Priority Action) (I-85-4)

The National Transportation Safety Board is an independent Federal agency with the statutory responsibility ". . . to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). The Safety Board is vitally interested in any actions taken as a result of its safety recommendations and would appreciate a response from you regarding action taken or contemplated with respect to the recommendations in this letter.

BURNETT, Chairman, GOLDMAN, Vice Chairman, and BURSLEY, Member, concurred in these recommendations.

By: Jim Burnett
Chairman