Log I-68

# NATIONAL TRANSPORTATION SAFETY BOARD
## WASHINGTON, D.C.

ISSUED: December 6, 1983

Forwarded to:

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Research and Special Programs
Administration
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SAFETY RECOMMENDATION(S)

I-83-4

About 4:30 a.m., c.s.t., on March 29, 1983, a motorist traveling along Interstate 80 near Reno, Nevada, reported a noxious odor on the highway to the Nevada Highway Patrol. Patrolmen dispatched to locate the source of the odor traced it from the California/Nevada border to an industrial area north of Reno, near Sparks, Nevada -- a distance of approximately 20 miles. About 10 a.m., on March 30, 1983, the source of the odor was located in containers aboard a trailer truck at the Illinois-California Express (ICX) Freight Line terminal in Sparks. The shipping documents accompanying the truck described the lading as thirteen 55-gallon drums of "ACRYLIC ACID, Flammable Liquid, N.O.S.," shipped by the Oakland (California) Army Base (OAB) and consigned to the Hawthorne (Nevada) Army Ammunition Plant, located about 135 miles north of Sparks. Acrylic acid is listed as a corrosive material in 49 CFR Section 172.101.

Emergency personnel entered the trailer and found liquid leaking from a type-A stress fracture 1/ near the bottom chime 2/ of one drum. Labels attached to the drums, which were marked "ICC-17-E," identified their contents as cresylic acid, a poisonous substance according to 49 CFR Section 172.102. Acrylic acid and cresylic acid are different substances.

1/ A nonpuncture metal failure running parallel to the chime. A type-B stress fracture is at a right angle to the chime.
2/ The rim of the drum where the body and end are joined together.

Emergency personnel responding to the incident described the drums as weathered, corroded, and dented to various extents; and some personnel expressed doubts over their suitability for use in shipment. The Nevada Highway Patrol incident report stated:

> The drum in question split on the bottom lid seam. The drum indicated excessive wear and rust. The drum was loaded December 1951, indicating it has been sitting around for approximately 32 years. It would be reasonable to believe that those persons responsible to offer for shipment such a container would have doubt as to the strength of the container based on its exterior condition and the date on the drum.

On March 30, 1983, U.S. Army personnel overpacked the leaking drum in a new larger drum and arranged to provide corrected shipping papers for the remainder of the trip. The OAB transportation officer stated that the drums had been stored under unknown conditions somewhere in the South Pacific, shipped to the OAB on March 2, 1983, via Hawaii, and sandwiched between multilayered pallets surrounded by heavy gauge wire mesh. OAB personnel did not inspect or alter the drums before releasing them to ICX Freight Lines.

Criteria by which a shipper or carrier could reasonably determine whether a drum of this type could withstand the normal conditions of transportation without suffering a nonpuncture-type failure would appear to be significant considering the Department of Transportation's (DOT) statement that the DOT 17-E, 55-gallon drum, ". . . is well known as the most widely used packaging for hazardous liquid substances, where the degree of hazard falls within a range from relatively low to moderately severe," and "U.S. production of new drums that conform to the requirements of this specification was approximately 22.5 million units in 1980."3/ Moreover, drum failures account for 30 percent of all Chemical Transportation Emergency Center (CHEMTREC) assistance requests.4/

The Safety Board's search of DOT regulations and advisory material revealed that, beyond establishing the manufacturing specifications for the DOT 17-E drum (49 CFR Section 178.116), little information or criteria have been published for shipper's or carrier's employees to use in assessing the fitness of the drum to provide a reasonable level of safety during transportation. Title 49 CFR Section 171.2(a) states generally and in part that, "No person may offer or accept a hazardous material for transportation in commerce within the United States unless that material is properly classed, described, packaged, marked, labeled, and in the condition for shipment as required or authorized

3/ Federal Register Vol. 47, No. 112, June 10, 1982, p. 25167.
4/ CHEMTREC Red Phone Inbound Calls, August 1983.

by this subchapter..." (emphasis added). However, the regulation does not describe criteria by which to assess the condition of the drum even though, according to 49 CFR Section 172.204(a), by signing the shipping papers, the shipper certifies that the materials ". . . are in the proper condition for transportation. . . ."

Title 49 CFR Part 173 prescribes general requirements for shipments which are directed primarily at shippers but includes only a vague reference to the sufficiency of the container for shipment, i.e., 49 CFR Section 173.24(a), Standard Requirements For All Packages, provides, "Each package used for shipping hazardous materials under this subchapter shall be so designed and constructed, and its contents so limited, that under conditions normally incident to transportation -- (1) There will be no significant release of the hazardous materials to the environment. . . ."

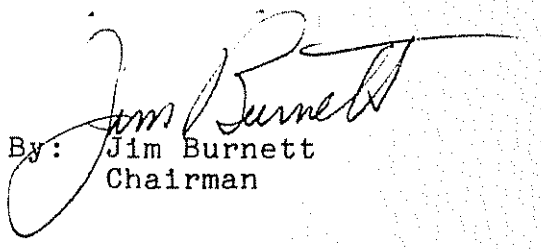
To assess the industry's view of what constitutes "proper condition for transportation," the Safety Board contacted two carrier representatives with a total of 80 years' experience in investigating drum failures during transportation. Both representatives agreed that a visual inspection is a standard industry practice but a poor predictor of stress failures since metal fatigue is usually not visible to the naked eye and obvious imperfections can be, and often are, inadvertently or otherwise covered by paint. One representative summarized his experience in determining a drum's proper condition for shipment as, "If it makes it to its destination, it was in proper condition; if it leaks, it wasn't."

The Safety Board believes that criteria should be established as an aid to those responsible for determining the proper condition for shipment of this highly used drum and others in use for shipping similar types and quantities of hazardous materials. Although legal and economic incentives exist to deter shippers from placing an obviously damaged drum into transportation, the Safety Board believes that guidance to detect less-obvious adverse conditions is warranted. Age, visible pitting, creases, significant reduction in metal thickness from rust, corrosion, and metal fatigue were mentioned by carrier representatives as a partial list of inspection items which could be used to assess the fitness of drums for transportation. These factors are not unlike those listed in 49 CFR Section 173.28(m)(1) in a visual inspection checklist for DOT 17-E and other drums being reconditioned for reuse. The Safety Board believes that information of this type would be equally beneficial to shipper and carrier personnel responsible for determining the preshipment condition of drums loaded with hazardous materials.

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

> Develop, for drums being used to ship regulated hazardous materials, preshipment inspection criteria similar to those established in 49 CFR Section 173.28(m)(1) for drums being reconditioned for reuse, and publish these criteria to assist shippers and carriers in complying with the requirements of 49 CFR Section 171.2(a) and 173.24(a). (Class II, Priority Action) (I-83-4)

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



By: Jim Burnett
Chairman