



# National Transportation Safety Board

Washington, D. C. 20594

Safety Recommendation

LDG 2101A

Date: October 24, 1988

In reply refer to: A-88-120

Ms. M.Cynthia Douglass  
Administrator  
Research and Special Programs  
Administration  
Department of Transportation  
Washington, D.C. 20590

On February 3, 1988, American Airlines flight 132, a McDonnell Douglas DC-9-83, departed Dallas/Fort Worth International Airport, Texas, for Nashville Metropolitan Airport, Tennessee. In addition to the passenger luggage in the midcargo compartment, flight 132 was loaded with a 104-pound fiber drum of textile treatment chemicals. Undeclared and improperly packaged hazardous materials inside the fiber drum included 5 gallons of hydrogen peroxide solution and 25 pounds of a sodium orthosilicate-based mixture. While in flight, a flight attendant and a deadheading first officer notified the cockpit crew of smoke in the passenger cabin. The passenger cabin floor above the cargo compartment was hot and soft, and the flight attendants had to move passengers from the affected area. The captain, who was aware of a mechanical discrepancy with the auxiliary power unit (APU) on an earlier flight which resulted in in-flight fumes, was skeptical about the flight attendant's report of smoke. No in-flight emergency was declared. After landing, the captain notified Nashville Ground Control about the possibility of fire in the cargo compartment, and he requested fire equipment. The flight attendants then initiated procedures to evacuate the airplane on the taxiway. About 2 minutes 8 seconds after the plane landed, the 120 passengers and 6 crewmembers began evacuating the airplane. After the plane was evacuated, crash/fire/rescue personnel extinguished the fire in the cargo compartment.<sup>1</sup>

Following the accident, laboratory tests were conducted to determine the capability of materials shipped in the fiber drum and the consequences. The Safety Board concluded that the 5-gallon polyethylene drum packaged inside the fiber drum contained 50 percent strength hydrogen solution; that hydrogen peroxide solution leaked from the polyethylene drum before being loaded aboard flight 132 and again in flight while aboard flight 132; that a combination of the hydrogen peroxide solution, sodium orthosilicate-based mixture, and the previously wet fiber drum

<sup>1</sup>For more detailed information, read Hazardous Materials Incident Report--*In-Flight Fire, McDonnell Douglas DC-9-83, N569AA, Nashville Metropolitan Airport, Nashville, Tennessee, February 3, 1988* (NTSB/HZM-88/02).

caused the in-flight fire in the midcargo compartment. During the investigation, the Safety Board determined that the hazardous materials shipped in the fiber drum did not comply with U.S. Department of Transportation (DOT) safety regulations for several reasons:

- Fifty percent strength hydrogen peroxide solution, in any quantity, is forbidden aboard passenger-carrying aircraft. Even 35 percent strength hydrogen peroxide solution is restricted to a maximum quantity of 1 quart per container for passenger-carrying aircraft.
- The hydrogen peroxide solution, an oxidizer, and the sodium orthosilicate-based mixture, a solid corrosive material, are not compatible and should not have been packaged together.
- While DOT-34 polyethylene drums may be used for 35 percent or 50 percent strength hydrogen peroxide solution, the drums must be equipped with vented closures to prevent the accumulation of internal pressure. However, had it been vented it would have been prohibited aboard aircraft.
- Neither proper shipping names nor hazard class information for hazardous materials packaged inside the fiber drum were marked on the outside of the fiber drum.
- Proper package orientation information was not marked on the outside of the fiber drum overpack to instruct handlers to keep the package upright.
- Hazardous materials warning labels were not affixed to the outside of the fiber drum.
- The shipper did not describe the materials and their hazards properly on shipping papers provided to the air carrier.

In addition to proper packaging of hazardous materials, the safe transportation of hazardous materials depends on sufficient information to identify the materials and the hazards presented during transportation. Accordingly, both shippers and carriers have a responsibility to determine if materials offered for transportation are hazardous and are in proper condition to ensure their safe transportation. As the shipper, Textile Treatments International, Inc., not only failed to provide a proper description of the hazardous materials on the shipping paper, but it also failed to provide a description of the contents to American Airlines that would have alerted the carrier that the package contained hazardous materials. Both the hand-written and the typed shipping documents indicated that the shipper told the air carrier that the fiber drum contained laundry equipment, not chemicals. There is no factual evidence to support the shipper's contention that he told the freight clerk that the fiber drum contained laundry chemicals. Had he done so, the word "chemicals" should have alerted the air carrier to the possibility of hazardous materials.

The National Transportation Safety Board found no statistics to identify the total number of shipments offered for air transportation each year that were found to contain undeclared hazardous materials. However, by reviewing incident reports filed with the DOT, the Safety Board was able to identify hazardous materials incidents that involved undeclared hazardous materials. Between 1971 and March 1988, there were 2,260 hazardous materials incident reports involving air

transportation filed with the DOT. Forty-two of these incidents resulted in two or more injuries or more than \$10,000 property damage; 22 of the 42 incidents involved undeclared hazardous materials. Additionally, a review of the DOT data for January 1980 through March 1988 disclosed that 1,091 reports were filed for air transportation incidents. Nine of the 1,091 incidents resulted in fires or explosions; 8 of the 9 fires or explosions involved undeclared hazardous materials.

One of these incidents was strikingly similar to the incident that occurred in Nashville, and it involved an undeclared shipment of hazardous materials for transportation through an air freight forwarder. The shipment involved 12 1-gallon containers of 35 percent hydrogen peroxide solution packaged in overpack containers. The hydrogen peroxide solution was also shipped for use in a demonstration, and no hazardous materials were declared on the shipping papers. Instead, the shipping papers described the contents of the packages as "ceiling cleaning solution and equipment." Furthermore, no hazardous materials markings or labels were affixed to the outside of overpacks to warn cargo handlers about the hazardous contents. The shipment originated in Pompano Beach, Florida, on October 31, 1986, and the destination was the Philippines. On November 6, 1986, in Seattle, Washington, cargo handlers found several packages in the shipment soaked with liquid and subsequently determined that 1 to 2 gallons of hydrogen peroxide had leaked from inner containers. Shipper representatives later said that they were unaware of hazardous materials transportation safety requirements when they offered the cargo to an air freight forwarder for transportation.

Industry also has recognized that undeclared hazardous materials present a problem. The International Air Transport Association dangerous goods regulations (Section 1.6.3) address precautionary measures against hidden hazards in cargo and baggage. It notes that experience has shown that shippers using some descriptions to declare the contents of their packages must be asked to check their consignments against the class definitions in the regulations and to confirm that the contents are not restricted.

Following a series of misdeclarations of freight, Swissair imposed new requirements on shippers who describe consignments in generic terms--shipping descriptions must include the phrase "not restricted." Unless the additional description is included with the shipping name, the cargo is assumed to contain hazardous materials.

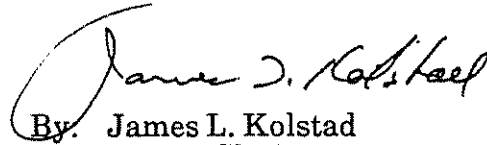
While the DOT regulations require air passenger carriers to inform passengers about hazardous materials restrictions by posting a notice at locations where tickets are issued, baggage checked, and aircraft boarded, there are no requirements that notices be posted at freight counters where air cargo is offered to air carriers or to air freight forwarders. While American Airlines also posts this notice at freight counter locations, other passenger carriers and cargo-only carriers do not. The Safety Board believes that the DOT should require hazardous materials restriction notices to be posted at all air transportation freight acceptance facilities, including the facilities of air freight forwarders.

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

Require hazardous materials restriction notices to be posted at all air transportation freight acceptance facilities including air freight forwarder facilities. (Class II, Priority Action) (A-88-120)

Also, as a result of its investigation, the Safety Board issued Safety Recommendations A-88-115 through -119 to American Airlines, Inc.; A-88-121 through -128 to the Federal Aviation Administration; A-88-129 to the Air Transport Association of America; and I-88-7 to Textile Treatments International, Inc.

KOLSTAD, Acting Chairman, and BURNETT, LAUBER, NALL, and DICKINSON, Members, concurred in this recommendation.

A handwritten signature in cursive script, reading "James L. Kolstad". The signature is written in dark ink and is positioned above the typed name.

By. James L. Kolstad  
Acting Chairman