



# National Transportation Safety Board

Washington, D. C. 20594

Safety Recommendation

*LD92101C*

Date: October 24, 1988

In reply refer to: A-88-129

Mr. Gabriel Phillips  
Executive Vice President  
Air Transport Association of America  
1709 New York Avenue, N.W.  
Washington, D.C. 20006-5206

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 caused the in-flight fire in the midcargo compartment. In addition to proper packaging of hazardous materials, the safe transportation of hazardous materials

<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).

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 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.

It is likely that the materials were improperly packaged, marked, and described due, in part, to the shipper's ignorance about the regulations governing the transportation of hazardous materials. Even though the shipper may not have been aware of specific Federal transportation regulations, both the person who prepared and the person who offered this shipment for transportation should have been aware of the hazardous characteristics of the materials shipped and recognized the need to package the materials safely and to identify these materials to American Airlines. Hazardous materials labels and shipping descriptions were affixed to containers in the plant for both the hydrogen peroxide solution and the sodium orthosilicate-based mixture from which the shipped materials were taken. These warnings should have been sufficient to have caused the shipper to have determined that precautions were required when shipping these hazardous materials by air.

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 U.S. Department of Transportation (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. However, even when the notices are posted, the Safety Board has found the warnings to be inadequate. DOT regulations require the notices to be "prominently displayed" and the lettering to be printed on a background of contrasting color. Instead, notices are often posted at the sides of passenger ticket counters or at other locations that do not readily attract the attention of the public, and they are usually printed in black and white. The notices do not use bright, multiple colors or illustrations to attract the public's attention. In a safety study on passenger safety education,<sup>2</sup> the Safety Board noted that the visual attractiveness of information materials is important if the message is to be noticed and then read. Therefore, the Safety Board believes that in order to increase the effectiveness of the warning notices, air carriers should improve the design, content, and posted location of hazardous materials restriction notices.

The Air Transportation Association (ATA) documented problems involving undeclared shipments of hazardous materials in mail accepted by the U.S. Postal Service and which resulted in subsequent incidents in the air transportation system. It asked the U.S. Postal Service to take action to strengthen its hazardous materials program to reduce the number of packages accepted that contain undeclared hazardous materials. The ATA suggested that the U.S. Postal Service revise its regulations governing the acceptance of packages containing hazardous materials; that postal clerks at post office counters question customers to determine if packages contain undeclared hazardous materials; and that the U.S. Postal Service initiate a public awareness campaign using posters and handout materials to educate postal customers about restrictions governing hazardous materials.

In conjunction with its request, the ATA provided information to the U.S. Postal Service about similar actions already taken by the *Australia Post*. To address the

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<sup>2</sup>Safety Study--*Airline Passenger Safety Education: A Review of Methods Used to Present Safety Information (NTSB/SS-85/09)*.

problem of undeclared hazardous materials, the *Australia Post* produced training films to teach postal clerks how to identify packages that may contain undeclared hazardous materials and how to question customers about the contents of packages. Additionally, the ATA provided an *Australia Post* poster and handout material designed to educate customers about hazardous materials that should not be mailed. Both the poster and the handout use bright colors and illustrations to attract the attention of customers and to deliver the message. The U.S. Postal Service agreed with the ATA suggestions, has revised its hazardous materials regulations, and has initiated employee training and public awareness programs. The public awareness program will include newly designed, multiple-color posters and handout materials to attract the attention of postal customers.

However, the ATA has not recommended that its members take actions similar to recommendations it has made to the U.S. Postal Service. Because the Safety Board found the American Airlines procedures for accepting general freight packages and for identifying undeclared hazardous materials to be typical of other passenger and cargo air carriers, the Safety Board believes that the ATA should assist its member air carriers in the development of an improved public education and awareness program, assist its members in designing warning notices to attract the attention of shippers, and encourage its members to question customers, including air freight forwarders about the possibility of hazardous materials in general freight packages.

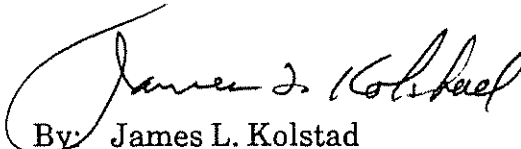
Therefore, the National Transportation Safety Board recommends that the Air Transport Association:

Develop, in coordination with members, a program to more effectively inform and warn passengers and shippers about restrictions and safety requirements for hazardous materials and to improve methods of detecting undeclared hazardous materials offered for air transportation. (Class II, Priority Action) (A-88-129)

Also, as a result of its investigation, the Safety Board issued Safety Recommendations A-88-115 through -119 to American Airlines, Inc.; A-88-120 to the Research and Special Programs Administration; A-88-121 through -128 to the Federal Aviation Administration; and I-88-7 to Textile Treatments International, Inc.

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 action taken as a result of its safety recommendations. Therefore, it would appreciate a response from you regarding action taken or contemplated with respect to the recommendation in this letter. Please refer to Safety Recommendation A-88-129 in your reply.

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

  
By: James L. Kolstad  
Acting Chairman