



# National Transportation Safety Board

Washington, D.C. 20594

## Safety Recommendation

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**Date:** August 12, 1998

**In reply refer to:** A-98-71

Honorable Rodney E. Slater  
Office of the Secretary  
Department of Transportation  
400 7<sup>th</sup> Street, S.W.  
Washington, D.C. 20590

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About 0554 eastern daylight time,<sup>1</sup> on September 5, 1996, a Douglas DC-10-10CF, N68055, operated by the Federal Express Corporation (FedEx) as flight 1406, made an emergency landing at Stewart International Airport, Newburgh, New York, after the flightcrew determined that there was smoke in the cabin cargo compartment. The flight was operating under the provisions of Title 14 Code of Federal Regulations (CFR) Part 121 as a cargo flight from Memphis, Tennessee, to Boston, Massachusetts. Three crewmembers and two nonrevenue passengers were aboard the airplane. The captain and flight engineer sustained minor injuries while evacuating the airplane. The airplane was destroyed by fire after the landing.

The National Transportation Safety Board determined that the probable cause of this accident was an in-flight cargo fire of undetermined origin.<sup>2</sup>

### Prohibited Items On Board the Accident Airplane

After the fire, investigators discovered a DNA synthesizer in cargo container 6R that contained small quantities of flammable liquids (including acetonitrile and tetrahydrofuran). These chemicals are classified by the Research and Special Programs Administration as hazardous materials and are therefore subject to Department of Transportation (DOT) requirements for packaging, labeling, and shipping documentation to accurately identify the hazardous nature of the shipment. However, because the synthesizer was not intended to be shipped with any hazardous materials, it was shipped as general freight and was not packaged or labeled in accordance with those requirements and was not accompanied by the required paperwork.

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<sup>1</sup> Unless otherwise indicated, all times are eastern daylight time, based on a 24-hour clock.

<sup>2</sup> National Transportation Safety Board. 1998. *In-Flight Fire/Emergency Landing, Federal Express Flight 1406, Douglas DC-10-10 N68055, Newburgh, New York, September 5, 1996*. Aircraft Accident Report NTSB/AAR-98/03. Washington, DC.

Several other items discovered on board the accident airplane might also have constituted shipments of undeclared hazardous materials. Seven aerosol cans and several plastic bottles containing acidic or alkaline liquids that could be corrosive, and two samples containing potentially flammable or combustible liquids were found in the cargo debris.<sup>3</sup> Although the original contents of the aerosol cans recovered from the accident aircraft could not be determined, aerosol cans, as pressurized containers with compressed gases, are regulated hazardous materials. The acidic and alkaline liquids in the plastic bottles were also likely subject to the DOT hazardous materials regulations as corrosive materials. Although the DOT hazardous materials regulations allow exceptions to packaging, marking, labeling, or shipping paper requirements, depending on the quantity and form of the material being shipped, these exceptions generally are not applicable when the item is being transported by air. Consequently, the aerosol cans and the containers of acidic liquid likely constituted undeclared shipments of hazardous materials. Although these items were ruled out as possible ignition sources of the fire, they again raise concerns about the prevalence of unknown hazardous materials being carried on board airplanes.

The ease with which prohibited materials can find their way onto commercial airplane flights was further highlighted by the discovery of several illegal shipments of marijuana on board the accident flight. Marijuana is not classified as a hazardous material for purposes of air transportation, and the marijuana found on board flight 1406 was not a factor in the accident. Further, the Safety Board notes that most undeclared shipments of hazardous materials are unintentional, although the shipment of marijuana is clearly a deliberate attempt to ship contraband material. Nonetheless, the Safety Board concludes that the presence of the aerosol cans, the containers of acidic liquid, as well as several packages of marijuana on board the accident flight illustrates that common carriers can be unaware of the true content of many of the packages they carry.

### **Federal and Industry Oversight**

The shipment of undeclared and improperly packaged hazardous materials on board airplanes and the oversight by the Federal Aviation Administration (FAA) and air carriers to detect and identify such shipments was most recently addressed by the Safety Board in its report of the May 11, 1996, accident involving ValuJet Airlines. The Safety Board determined that the in-flight fire was initiated by the actuation of one or more chemical oxygen generators being improperly carried as cargo. These generators had not been identified as hazardous materials and were not properly packaged for transportation.

The Safety Board stated in the ValuJet report that the practices, procedures, and training of the personnel involved in the identification and handling of undeclared hazardous materials have remained inadequate. The Safety Board further noted that the ValuJet accident and incidents that occurred after that accident clearly demonstrate that the shipment of undeclared

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<sup>3</sup> The hazardous materials regulations define a corrosive material as "a liquid or solid that causes full thickness destruction of human skin at the site of contact within a specified period of time; [or a] liquid that has a severe corrosion rate on steel or aluminum." (49 CFR 173.136.) They also prescribe packaging standards based on the length of exposure of the corrosive material to human skin and the time after exposure for destruction of the skin to occur. (49 CFR 173.137.)

hazardous materials in air transportation is a serious problem that has not been adequately addressed. In the ValuJet report, the Safety Board further stated the following:

[T]he FAA has initiated the evaluation requested by the Safety Board in Safety Recommendations A-96-25 and -26 of the practices and training provided by all air carriers for accepting passenger baggage and freight shipment (including COMAT [company materials]) and for identifying undeclared or unauthorized hazardous materials that are offered for transport and, based on this evaluation, to require air carriers to revise as necessary their practices and training in this area.

Further, the FAA is developing a hazardous materials education and enforcement program that will focus on air freight forwarders. Also, shortly after August 1996, the FAA issued, under 14 CFR Part 109 (Indirect Air Carrier Security), shipper endorsement requirements that require all shippers, and freight forwarders to certify that all packages being shipped do not contain unauthorized explosives, destructive devices, or hazardous materials. Signing the endorsement also gives permission to search the shipment. Because the transport of oxygen generators has continued since the accident, despite the regulations, the Safety Board will closely monitor the FAA's progress in fulfilling these proposed improvements.

The FAA initiatives that have been undertaken since the ValuJet accident (e.g., hiring new agents, comprehensive inspections of carriers' and shippers' facilities, increased penalties for violations, a renewed outreach program, and the establishment of a database for trend analysis) are positive measures to reduce the number of hidden or undeclared shipments of hazardous materials. However, although the Safety Board supports these efforts, this accident illustrates that there is continued cause for concern. The Safety Board is especially concerned that, except in the case of properly packaged and declared shipments of hazardous materials, carriers generally do not inquire about the content of packages being shipped domestically, nor are they required to do so. The Safety Board also notes that the dangerous goods managers for FedEx and the FAA questioned the practicality and usefulness of carriers questioning a shipper about the contents of packages offered for shipment. Although air carriers and the FAA apparently agree on the seriousness of the problem, consideration is not being given to innovative measures, such as identifying package contents on the airbills or using technologies like x-ray machines to detect undeclared hazardous materials.

The Safety Board concludes that transportation of undeclared hazardous materials on airplanes remains a significant problem and more aggressive measures to address it are needed. Thus, the Safety Board believes that, in addition to the efforts already underway by the FAA, the DOT should require, within 2 years, that a person offering any shipment for air transportation provide written responses, on shipping papers, to inquiries about hazardous characteristics of the shipment, and develop other procedures and technologies to improve the detection of undeclared hazardous materials offered for transportation. The inquiries may include answering individual and specific questions about whether a package contains a substance that might be classified hazardous, (e.g., "does this package contain a substance that might be corrosive [or flammable, a poison, an oxidizer, etc.]")

As a result of the investigation of this accident, the National Transportation Safety Board recommends that the Department of Transportation:

Require, within 2 years, that a person offering any shipment for air transportation provide written responses, on shipping papers, to inquiries about hazardous characteristics of the shipment, and develop other procedures and technologies to improve the detection of undeclared hazardous materials offered for transportation. (A-98-71)

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in these recommendations.

By:

  
Jim Hall  
Chairman