United States General Accounting Office

GAO

Report to the Ranking Minority Member, Subcommittee on Aviation, Committee on Transportation and Infrastructure, House of Representatives

January 2003

AVIATION SAFETY

Undeclared Air Shipments of Dangerous Goods and DOT's Enforcement Approach

GAO-03-22

January 2003

AVIATION SAFETY

Undeclared Air Shipments of Dangerous Goods and DOT's Enforcement Approach

GAO Highlights

Highlights of GAO-03-22, a report to the Ranking Minority Member, Subcommittee on Aviation, Committee on Transportation and Infrastructure, House of Representatives

Why GAO Did This Study

When shipments of dangerous goods (hazardous chemical substances that could endanger public safety or the environment, such as flammable liquids or radioactive materials) are not properly packaged and labeled for air transport, they can pose significant threats because there is little room for error when something goes wrong in flight. To better understand the risks posed by improper ("undeclared") air shipments, we assessed what is known about their nature and frequency, what key mechanisms are in place to prevent their occurrence, and what the Department of Transportation (DOT) and the Postal Service do to enforce federal regulations for shipping dangerous goods by air.

Figure 1 shows how DOT regulates the air transport of dangerous goods in the United States.

What GAO Recommends

GAO recommends that DOT improve its enforcement approach by (1) determining whether the unique characteristics of air transport warrant the development of a legislative proposal that would enhance DOT's authority to inspect packages shipped by air and (2) requiring FAA to strengthen its policy on documenting the reasons for changes to the amounts of the recommended fines.

www.gao.gov/cgi-bin/getrpt?GAO-03-22.

To view the full report, including the scope and methodology, click on the link above. For more information, contact Gerald Dillingham at (202)-512-2384 or dillinghamg@gao.gov.

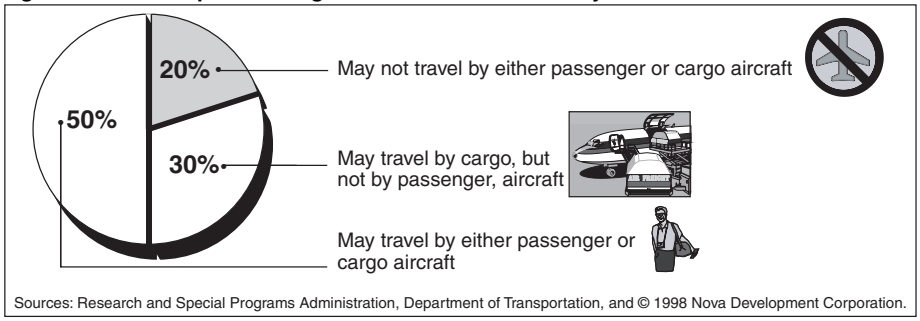
What GAO Found

Little is known about the nature and frequency of undeclared shipments of dangerous goods. While major carriers and the Postal Service believe such shipments are rare, their belief is based mainly on inspections of problem shipments, such as those that leak. Statistically valid, generalizable data are not available and would be difficult to obtain, not only because more inspections would entail costly delays for carriers but also because Constitutional protections limit DOT's and the Postal Service's inspection authority. DOT is seeking greater authority to open potentially problematic shipments for inspection, but its efforts are not limited to air transport and would not enable DOT's Federal Aviation Administration (FAA) to obtain statistically valid, generalizable data on the nature and frequency of undeclared air shipments. A change in the law requiring that shippers consent to the opening of packages for inspection might be appropriate for air transport and would enable FAA to obtain such data. FAA could then identify the resources and actions needed to address the problem.

Federal regulations create a framework for transporting dangerous goods safely, and outreach to shippers and carriers helps to prevent undeclared shipments. Private industry does business primarily with "known shippers" (those that have shown they comply with the regulations). The Postal Service cannot restrict its business to known shippers, but it requires customers to bring packages weighing 16 ounces or more to a post office for screening. Carriers and the Postal Service both train their employees to screen for undeclared shipments.

The Postal Service and FAA monitor and enforce compliance with federal regulations for transporting dangerous goods by air. However, the Postal Service cannot fine violators and seldom takes criminal action, since most violations are inadvertent. FAA's enforcement guidance calls for documenting the reasons for any changes in the fines its inspectors initially propose. GAO's review of enforcement case files indicates that the reasons for changes were not always documented. FAA attributes some changes to the results of penalty negotiations. Because FAA is not always following its guidance, it cannot ensure that its fines are appropriate or consistent.

Figure 1: Air Transport of Dangerous Goods Authorized by DOT



Sources: Research and Special Programs Administration, Department of Transportation, and © 1998 Nova Development Corporation.

Contents

Figures

Abbreviations

AAIRS	Airport and Air Carrier Information Reporting System
C.F.R.	Code of Federal Regulations
DOT	Department of Transportation
EIS	Enforcement Information System
FAA	Federal Aviation Administration
GAO	General Accounting Office
HMIRS	Hazardous Materials Information Reporting System
HMR	Hazardous Materials Regulations
RSPA	Research and Special Programs Administration
TSA	Transportation Security Administration
UNISHIP	Unified Shipper Enforcement Data System

GAO
Accountability * Integrity * Reliability

United States General Accounting Office
Washington, DC 20548

January 10, 2003

The Honorable William O. Lipinski
Ranking Minority Member
Subcommittee on Aviation
Committee on Transportation and Infrastructure
House of Representatives

Dear Mr. Lipinski:

Each day, businesses, individuals, and government agencies package and ship dangerous goods on ships, trains, trucks, and airplanes.[1] Dangerous goods are by definition chemical, including infectious, substances (or anything containing such substances) that pose a threat to public safety or the environment during transportation. When these goods are properly packaged, labeled, and stowed onboard, they can be transported safely, but when they are not, they can pose significant threats to people and property. Improper, or "undeclared,"[2] shipments of dangerous goods are particularly dangerous in air transport because there is little room for error or time to take corrective action if a problem occurs in flight—a lesson learned tragically in 1996 when a ValuJet plane crashed in Florida after oxygen generators caught fire in the plane's cargo compartment.

To better understand the overall risks that undeclared shipments of dangerous goods can pose to aviation safety, we examined the Department of Transportation's (DOT) and the U.S. Postal Service's monitoring of the transportation of dangerous goods by commercial cargo and passenger aircraft, although we focused primarily on cargo aircraft. As agreed with your office, we addressed three researchable questions:

[1]The Hazardous Materials Transportation Act, as amended, principally governs the transportation of dangerous goods. It is codified at title 49, chapter 51, of the United States Code.

[2]We use the term "undeclared" to describe two types of improper shipments of dangerous goods: (1) those that a shipper has explicitly denied are hazardous or has not identified as hazardous and (2) those that a shipper has identified as hazardous but has otherwise misrepresented (for example, the shipper has understated the quantity so that the materials can be shipped by passenger aircraft rather than by cargo aircraft).

- What do DOT, the Postal Service, and others involved in the commercial air transport of dangerous goods know about the nature and frequency of undeclared shipments?

- What are the key mechanisms the federal government and private industry have in place to prevent dangerous goods shipments from compromising aviation safety?

- What do DOT and the Postal Service do to enforce federal regulations for shipping dangerous goods by air?

We focused our review primarily on the shipments of dangerous goods onboard cargo aircraft, in part, because more types and quantities of dangerous goods are permitted on cargo aircraft than on passenger aircraft. To address these questions, we analyzed recent reports by DOT on its dangerous goods programs and on the threat that carrying such goods can pose, particularly when the shipments are undeclared. We reviewed research on methods that might be used to estimate the frequency of undeclared shipments, and we consulted with both GAO and academic experts in these methods. To determine the extent to which undeclared shipments may occur, we interviewed officials of four major carriers that handle over 60 percent of annual air freight traffic in the United States, and we visited the premises of three of these carriers to review their procedures for identifying and preventing undeclared dangerous goods shipments. We also reviewed the results of a joint effort by the Federal Aviation Administration (FAA) and the U.S. Customs Service, which has the authority to inspect and search international shipments, to detect, among other things, undeclared dangerous goods shipments. We interviewed Postal Service, FAA, and other DOT officials with various oversight responsibilities for dangerous goods transportation. To evaluate FAA's enforcement strategy, we examined the agency's assessments in 30 cases. These cases were randomly selected to fairly represent the full range of over 2,000 cases in the database. While the number of cases we tested was too small for us to estimate the extent to which FAA's enforcement strategy was followed in the entire database, our examination allowed us to describe the types of practices that occur at critical points in the penalty assessment process. Our detailed scope and methodology appears at the end of this report.

Results in Brief

DOT, the Postal Service, and major carriers know that undeclared air shipments of dangerous goods occur and can have serious consequences, but they lack statistically valid, generalizable data to reliably estimate the

nature and frequency of such shipments, assess their risks, profile potential violators, and allocate resources optimally for prevention, detection, and correction. DOT researchers have concluded that data are not available to reliably estimate the nature and frequency of dangerous goods shipments or assess their risks. Carriers maintain that such shipments are rare, but their views are based almost entirely on the occurrence of incidents—shipments that were opened after a leak, spill, odor, or other anomaly suggested a potential problem—rather than on information about shipments that gave no cause for opening. Technological, economic, and legal hurdles combine to make estimates of undeclared dangerous goods shipments difficult. The current less intrusive screening equipment is not designed to detect many types of dangerous goods, and therefore opening packages is the only reliable means of obtaining information on undeclared shipments. While carriers generally obtain the consent of shippers to open packages that they accept for shipment, they seldom open packages because doing so is too slow and costly to be practicable except when incidents occur. Under the Fourth Amendment to the Constitution, which prohibits unreasonable searches and seizures, DOT may generally not open and inspect packages without a search warrant or the shipper's consent. The Postal Service treats First Class or Express mail packages traveling by air as being sealed against inspection and protected by the Fourth Amendment. Without the authority to open packages for inspection, neither DOT nor the Postal Service is in a position to gather data on undeclared shipments of dangerous goods.

To prevent dangerous goods shipments from compromising safety, the federal government relies on regulation, research, and outreach, and private industry relies on policies for dealing with "known shippers" (a DOT term for shippers that have demonstrated their previous business history), other restrictions on customers or the materials they carry, training, and sanctions. Federal regulations create a framework for transporting dangerous goods safely. If DOT finds that these regulations are insufficient to ensure safety, it can sponsor and has sponsored research to determine how it should modify the regulations. DOT and the Postal Service also provide information to the public on materials that may not be shipped by air. Carriers try to prevent dangerous goods shipments from compromising safety by dealing preferentially with known shippers. In addition, some carriers accept fewer types of dangerous goods for shipment than the law allows. While the Postal Service cannot limit its business to known shippers, it restricts the materials it accepts for shipment and requires shippers to bring packages weighing 16 ounces or more to a post office, where employees can ask questions about the contents. Carriers, including the Postal Service, also train their employees

to be a first line of defense against undeclared shipments. Finally, carriers may require shippers to take remedial training or may refuse to do business with them if they repeatedly violate the dangerous goods regulations.

To evaluate the effectiveness of and enforce federal regulations for shipping dangerous goods by air, DOT collects data on incidents involving dangerous goods, monitors shippers' and carriers' performance, and assesses civil penalties. DOT has the authority to either assess civil penalties or seek criminal enforcement action against violators. Within DOT, FAA is responsible for enforcing compliance with the regulations for shipping dangerous goods by air, while the Transportation Security Administration, which is scheduled to be transferred to the new Department of Homeland Security, is responsible for the security of cargo shipments. To ensure that appropriate civil penalties are assessed, FAA's enforcement guidance requires the agency to consider the compliance history of violators across all modes of transportation. This guidance was difficult for FAA to follow because most operating administrations were not submitting current enforcement data to DOT. DOT has directed its operating administrations to submit current enforcement data to a centralized database, so that the administrations can obtain current information on the compliance history of violators across the modes. To ensure that similar cases are treated consistently and fairly, FAA's enforcement guidance also requires the agency to document the reasons for any reduction in a recommended civil penalty. Our analysis of FAA's case files indicates that the agency is not always following this policy. We are recommending that FAA document its penalty assessments, as required, so that it can demonstrate that it is handling similar cases consistently.

The Postal Service also collects data on actual releases of dangerous goods being transported, monitors the compliance of shippers and carriers, and can seek criminal penalties for violations of its regulations; however, it cannot impose civil penalties for such violations. According to industry officials, many dangerous goods violations result from ignorance. Under such circumstances, the Postal Service maintains, civil penalties may be appropriate and would make it easier to recover the sometimes substantial costs of cleanup and damages. DOT's hazardous materials reauthorization proposal includes a provision that would allow the Postal Service to impose civil penalties.

This report contains recommendations to DOT that FAA evaluate the need for additional inspection authority to obtain statistically valid data on

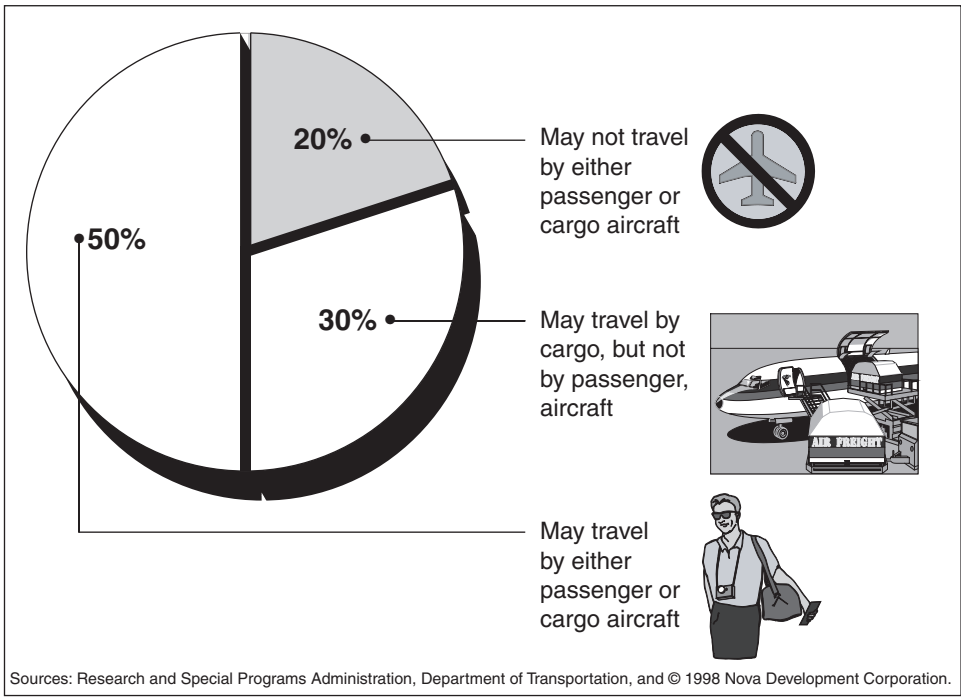
undeclared air shipments of dangerous goods and document its penalty assessments, as required, so that it can demonstrate that it is handling similar cases consistently. DOT agreed with our recommendations, and DOT and the Postal Service generally agreed with the facts in our report. Both DOT and the Postal Service provided clarifying and technical comments, which we incorporated as appropriate.

Background

DOT regulates tens of thousands of dangerous goods, which can include poisons, pesticides, radioactive materials, and explosives.[3] About 20 percent of these goods may not travel by air at all. As shown in figure 1, the remainder may travel on passenger or cargo aircraft, or both.

[3]Each time someone ships dangerous goods, the contents of the shipment must be identified by using 1 of over 3,400 different shipping names. A shipping name can refer to a specific material that DOT has identified as dangerous; it can also be a generic description for a material that meets the overall criteria for a dangerous goods class, but for which there is not a division (within that class) to more precisely identify it. According to DOT, because many materials are identified using the generic descriptions within each class, the actual number of dangerous goods is much greater than the 3,400 shipping names that DOT spells out.

Figure 1: Air Transport of Dangerous Goods Authorized by DOT



Sources: Research and Special Programs Administration, Department of Transportation, and © 1998 Nova Development Corporation.

Using a United Nations classification system, DOT divides all dangerous goods into nine general classes according to their physical, chemical, biological, and nuclear properties. Most of the dangerous goods that may not travel by air at all are the most highly explosive, toxic, oxidizing, self-reactive, or flammable chemical substances or articles in their class. In addition to prohibiting some types of dangerous goods from being carried by air at all, DOT restricts the types and amounts of other dangerous goods that any individual passenger or cargo aircraft may carry. For both passenger and cargo aircraft, DOT spells out these restrictions in four ways:

- *By name*—dangerous goods that represent an unacceptable hazard on aircraft or are known to have caused an aircraft fire or explosion, such as chemical oxygen generators, are specifically forbidden by name.

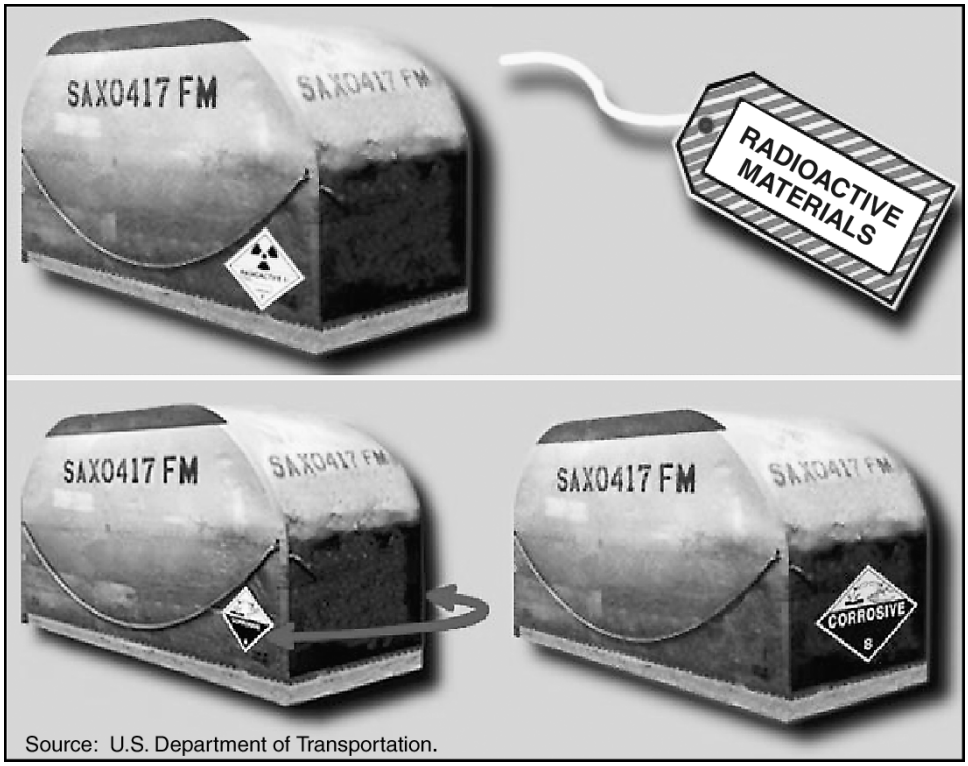
- *By hazard class and subdivision*—certain subdivisions of the classes of dangerous goods are known to be highly reactive or toxic (for example, most explosives and all spontaneously combustible materials), so DOT excludes them from passenger flights.

- *By quantities contained per outer package*—DOT restricts on passenger aircraft the quantity of certain substances or the number of articles that may be present in the outermost shipping containers in the cargo hold. For example, DOT allows the carriage of up to 30 liters of certain highly flammable liquids per outer package on cargo aircraft, but imposes limits of 1 liter or less on passenger aircraft.

- *By packaging integrity*—dangerous goods must be packaged so as to protect the integrity of the shipment and safeguard against accidental leaks or spills.

  For passenger aircraft, whose cargo areas are divided into multiple compartments, DOT also restricts the aggregate quantities of dangerous goods that may be carried per cargo compartment. Figure 2 shows the kinds of containers in which dangerous goods typically travel in these cargo compartments.

Figure 2: Dangerous Goods Cargo Containers



Source: U.S. Department of Transportation.

Dangerous goods permitted onboard passenger aircraft include dry ice and solvents; cargo aircraft may also carry materials such as paint or medical waste. Table 1 provides a complete listing of the nine classes of dangerous goods, their descriptions, an example for each class, and some of the restrictions DOT places on the carriage of each by type of aircraft.

Table 1: Dangerous Goods Classes and Descriptions

Class	Description	Example(s)	Cargo aircraft restrictions	Passenger aircraft restrictions
1	Explosives	Fireworks	Most are forbidden	Most are forbidden
2	Gases	Propane	Most are permitted within quantity limitations	Most are forbidden
3	Flammable liquids	Acetone, lighter fluid, paints	Most are permitted, except those that are toxic by inhalation	Most are permitted within quantity limitations
4	Flammable solids	Safety matches	Most are permitted within quantity limitations; others are forbidden (for example, spontaneously combustible materials)	Most are permitted within quantity limitations
5	Oxidizers and organic peroxides	Swimming pool chemicals	Most are permitted within quantity limitations; others are forbidden (for example, temperature-controlled organic peroxides)	Most are permitted within quantity limitations
6	Toxic materials and infectious substances	Regulated medical waste, motor fuel anti-knock mixtures	Most are permitted within quantity limitations, exceptions for subsidiary risks[a] or those that are toxic by inhalation	Most are permitted within quantity limitations
7	Radioactive materials	Uranium hexafloride	[b]	[b]
8	Corrosive materials	Batteries, cleaning compounds	Most are permitted within quantity limitations	Most are permitted within quantity limitations
9	Miscellaneous dangerous goods	Asbestos	Most are permitted within quantity limitations	Most are permitted within quantity limitations

Source: U.S. Department of Transportation, RSPA.

[a]"Subsidiary risk" means that the dangerous good also meets the definition of one or more other classes.

[b]For nearly all radioactive materials, the Department of Transportation's Research and Special Programs Administration (RSPA) spells out restrictions in terms of the radiological reading that comes from the package rather than a quantity limit (as it does for other classes of dangerous goods).

According to the U.S. Census Bureau's most recent survey on the movement of hazardous goods in the United States, class 3 dangerous goods (flammable liquids, such as paint) account for the greatest portion (by weight) of the nine classes of dangerous goods shipped by air. However, the vast majority of flammable liquids travel by other modes. The percentage of total shipments made by air was greatest for radioactive

materials (class 7)—just over 8 percent of the total radioactive tonnage shipped in 1997 was shipped by air. According to FAA, cargo aircraft, such as those operated by the major delivery services FedEx and United Parcel Service, Inc. (UPS), carry about 75 percent of the nation's dangerous goods air shipments. The remaining 25 percent travel onboard passenger aircraft in cargo compartments.

Ensuring the safe transportation of dangerous goods by air is a shared responsibility of federal agencies, shippers, and airlines—the success of which ultimately depends on the efforts of thousands of individuals every day. Within DOT, the following have responsibility for dangerous goods:

- The Research and Special Programs Administration (RSPA) regulates the transportation of dangerous goods by truck, train, ship, pipeline, and plane. It decides which materials to define as hazardous; writes the rules for packaging, handling, and carrying them; and prescribes training requirements for shippers' and carriers' dangerous goods employees. RSPA, along with the other DOT operating administrations that operate and manage dangerous goods programs,[4] conducts inspections and investigations to determine compliance with dangerous goods laws and regulations for all modes of transportation and, where appropriate, initiates enforcement actions against those it finds not to be in compliance. RSPA maintains a database for closed dangerous goods enforcement actions from these operating administrations, and another database that tracks dangerous goods incidents from these operating administrations.

- The Office of Intermodalism, reporting to the Secretary of Transportation, is responsible for implementing recommendations from a March 2000 evaluation of DOT's dangerous goods program,[5] coordinating intermodal and cross-modal dangerous goods activities, and coordinating DOT-wide outreach activities. For example, in 2001, to improve awareness of dangerous goods incidents occurring during shipments, this office sent out letters to shippers most frequently identified in RSPA's dangerous goods incident database.

[4]The DOT operating administrations that operate and manage dangerous goods programs include the Federal Aviation Administration, the Federal Motor Carrier Safety Administration, the Federal Railroad Administration, the Research and Special Programs Administration, and the United States Coast Guard.

[5]U.S. Department of Transportation, *Departmentwide Program Evaluation of the Hazardous Materials Transportation Program*, *Final Report* (March 2000).

- FAA carries out responsibilities for ensuring compliance with the rules for transporting dangerous goods by air. In addition, FAA assesses carriers' operations and investigates dangerous goods incidents or accidents. FAA also has other responsibilities, including those relating to the prosecution and adjudication of enforcement actions against those found to have violated the dangerous goods rules.

  The Postal Service is both a carrier and a shipper of dangerous goods because it not only carries shipments on aircraft that it leases, but it also sends U.S. mail onboard commercial passenger and cargo airlines. As a result, the airlines carrying U.S. mail rely on the Postal Service as a first line of defense in ensuring the safety of the packages they accept for transport and in preventing the shipment of anything that should not travel by air.

  Shippers—whether they are businesses or individuals—have the primary responsibility for ensuring the safety of their dangerous goods shipments. They are required to train their employees to package their shipments safely and to tell the carriers to whom they deliver these shipments that they contain dangerous goods. Carriers share some of the responsibility for the safe transportation of dangerous goods. They do so by training their employees to handle these shipments properly, to identify likely instances of improper shipments (such as those containing undeclared dangerous goods), and to verify that the indirect air carriers from whom they accept consolidated cargo shipments have FAA-approved security programs in place to prevent explosive or incendiary devices from being placed onboard.[6] Carriers are also responsible for reporting to DOT any instance of noncompliance they discover.

[6]An indirect air carrier accepts and delivers cargo to commercial airlines for transport. An example of an indirect air carrier would be a freight forwarder that consolidates shipments from a large number of shippers and then transports them via the cargo compartments of commercial aircraft. Because the U.S. Postal Service uses commercial aircraft to ship the mail, the FAA also considers it an indirect air carrier.

Shipments of Undeclared Dangerous Goods Can Have Serious Consequences, but Their Nature and Frequency Are Difficult to Estimate

From tragic accidents over the years and day-to-day experience in handling cargo traffic, DOT and major carriers know that shipments of undeclared dangerous goods can have disastrous consequences. The nature and frequency of such shipments—and, by extension, the amount of effort that should be put into stopping them—are difficult to estimate because of data limitations. However, the inability of commercially available screening equipment to detect many types of dangerous goods, the costs of delaying shipments to inspect them, and restrictions against opening certain packages may preclude the collection of data.

Consequences of Carrying Undeclared Dangerous Goods Have Been Serious and Remain a Concern

Undeclared and other improper shipments of dangerous goods can pose a high risk because of the nature of air transportation. In recent years, both RSPA and FAA have expressed concern about undeclared dangerous goods shipments. In its departmentwide March 2000 evaluation of the dangerous goods program, DOT reported that the United States has a relatively good safety record, given the amounts of dangerous goods that are shipped by all modes of transportation each year. However, DOT added that the potential still remains for dangerous goods incidents with catastrophic consequences, and, even though relatively small amounts of dangerous goods travel by air (compared with other modes of transportation), a single mishap can have serious consequences. For example, FAA has reported the following incidents:

- In 1996, a major passenger airline carried undeclared dangerous goods—calcium hypochlorite and liquid bleach—on a flight from California to Jamaica. Upon arrival, airport personnel discovered smoke coming from the aircraft's cargo doors and encountered toxic fumes when they opened the cargo compartment. The box of undeclared dangerous goods was leaking and burst into flames shortly after the airport personnel removed it from the cargo hold.

- In 1998, an undeclared shipment of electric storage batteries (considered "wet" because they contain either electrolyte acid or alkaline corrosive battery fluid) burst into flames while en route by truck to an airport, where it had been scheduled to be placed aboard a major passenger carrier's aircraft.

- In 1999, a major cargo carrier transported an undeclared shipment of liquefied petroleum gas from Portland, Oregon, to New York on a regularly

scheduled cargo flight. One day after arriving in New York, the package burst into flames at the carrier's sorting facility.

Three of the four major carriers we interviewed and DOT expressed concern about the safety of carrying dangerous goods. According to these three carriers, even though they discover relatively few undeclared shipments, their greatest safety concern in the air transportation of these goods is prompted by the undeclared shipments—particularly those they do not detect before accepting them. They expressed this concern over not knowing how much of the volume of undeclared dangerous goods they do not find, because these shipments present a greater risk than do those that shippers properly declare.

The major cargo carriers we interviewed and the Postal Service agreed that ignorance or misunderstanding of the rules for transporting dangerous goods is by far the most common reason why shippers fail to properly declare their dangerous goods shipments. According to one carrier, in very limited instances, shippers will deliberately not declare their shipments even when they know they are breaking the rules. However, no carrier cited cost as a reason why shippers fail to declare their shipments, even though shipping costs are usually higher for dangerous goods than for nondangerous goods. An official from one carrier stated that he had never seen a case of a shipper willfully failing to properly declare a dangerous goods shipment because of cost concerns. Furthermore, at the Postal Service, it is doubtful that cost is a cause of undeclared shipments, because the Postal Service does not charge more for carrying these shipments than it does for carrying those that are not hazardous; all of the Postal Service's charges are based on weight and class, regardless of the contents.

Data Limitations Make Estimates of Undeclared Dangerous Goods Shipments Difficult

According to a 1999 threat assessment published by DOT's Volpe Center,[7] three types of data that are needed to thoroughly assess the risks of carrying declared and undeclared dangerous goods by air were unavailable. These were

[7]The John A. Volpe National Transportation Systems Center is part of RSPA. It provides policy support, strategic planning, and analysis to customers within as well as outside DOT in areas such as strategic investment and resource allocation. Its work addresses issues in air and other modes of transportation.

- what amounts of dangerous goods are shipped by class and division (for all modes of transportation),
- how often incidents related to dangerous goods involve undeclared shipments, and
- what amounts and what types of undeclared dangerous goods are shipped by air.

Without these data, the Volpe Center was limited to assessing the threat from dangerous goods instead of the risk. The danger associated with a specific item is its "threat," while the likelihood that the threat will actually result in harm is its "risk." Assessing risk, according to the Volpe Center, requires some indication of the likelihood that dangerous goods will be present on an aircraft—and the data to determine this likelihood were not available.

Volpe Center officials attempted to find or compile data sources that would allow them to estimate the total amount of various dangerous goods that might be shipped (for example, over the course of a year), but they were unsuccessful. They found no single source of such data and were not able to piece together data sources. For example, Volpe Center staff attempted to compile data from chemical manufacturers to identify the total amounts of their products that move by air and the related distribution chain (that is, the amounts that move by other modes); this information would enable them to identify aggregate amounts of certain dangerous goods that shippers should be declaring, which would be a first step in working toward an estimate of undeclared shipments. However, the industry sources the Volpe Center consulted considered such information proprietary and would not share it. Volpe Center staff also considered assembling cargo manifest information from the airlines, because these records indicate for each flight the amounts and types of dangerous goods the aircraft is carrying. However, Volpe Center staff said the airlines informed them that these data are not in a form usable for such an analysis. Even if the manifest information were available, data on the overall amounts of dangerous goods shipments (such as the Volpe Center sought from the chemical industry) would still be necessary before this manifest information could be useful for estimating undeclared dangerous goods shipments.

According to Volpe Center staff, the limitations in the amount and quality of data on dangerous goods shipments make estimating how many shipments contain undeclared dangerous goods more difficult. Our

experts in applied research and methodology agreed, noting that certain "hidden populations" methods might be useful for estimating the amount of undeclared dangerous goods shipments,[8] but only if data limitations such as those the Volpe Center identified were overcome. A Massachusetts Institute of Technology expert in transportation research with whom we met agreed that none of the known methods for estimating hidden populations would be feasible for undeclared dangerous goods.

The major carriers we interviewed said they most commonly identify undeclared dangerous goods (after accepting them for shipment) when some occurrence prompts them to open a package or, in the case of the Postal Service, to set the package aside for further investigation (because the Postal Service generally cannot open such a package without a search warrant). Most often, this happens when a package leaks, spills, breaks open, or emits an odor, and the carrier or Postal Service employees identify the occurrence as potentially a dangerous goods incident.[9] One carrier also indicated that occasionally packages open as a result of handling or must be opened when they lose their address labels. In some of these instances, the company has discovered undeclared dangerous goods. This same company also noted that, on rare occasions, it learns of undeclared dangerous goods from informants—employees of either the company that shipped the package or competitors of that company.

The carriers we interviewed reported that, although they have the consent of shippers to open packages that have been accepted for shipment, they seldom discover undeclared dangerous goods. Although they did not cite a specific percentage, they described shipments of undeclared dangerous goods as "very rare" and "a handful." The numbers are believed to be similarly small for the Postal Service—officials estimated that declared dangerous goods represent less than one-tenth of 1 percent of their shipments, and the percentage of these shipments that is undeclared is

[8]The term "hidden populations" refers to those that are difficult to count by traditional means because, for example, they involve illegal or undesirable conditions that people are unlikely to self-report. For example, illegal aliens or intravenous drug users would be considered "hidden populations," as would persons deliberately shipping undeclared dangerous goods.

[9]A dangerous goods incident is an event that results in a release, including an unanticipated or unintentional release, of hazardous material during the course of transportation. RSPA requires carriers to report incidents as soon as possible when they involve certain serious consequences, such as deaths or a change in the operational flight pattern of an aircraft. RSPA requires carriers to report all other incidents to the agency within 30 days of their occurrence.

"very small." The Volpe Center reported in a 1999 threat assessment that undeclared dangerous goods shipments made up about 0.05 percent of the shipments of several large cargo carriers, but this estimate was based on the recollections of the carriers of how many incidents they typically report to RSPA.

Because estimates by the Volpe Center, major carriers, and the Postal Service are based on reported incidents or memory, they are incomplete. Moreover, these estimates refer only to those undeclared shipments that resulted in dangerous goods incidents—they do not include undeclared shipments that never gave carriers cause to open them. As a result, according to the Volpe Center, there are no valid figures for the numbers of dangerous goods shipments that do not comply with regulations for transportation by air.[10]

Additionally, when a carrier reports an incident to DOT, RSPA does not currently require the carrier to report whether the shipper properly declared the dangerous goods. Consequently, the estimates of undeclared shipments reported by the Volpe Center and by carriers to us may not include all of the incidents carriers discovered, because the estimates are based on memory and are therefore subject to error. RSPA plans to remedy this limitation by requiring carriers to report whether dangerous goods shipments involved in incidents were declared or undeclared. To do so, RSPA is modifying its incident-reporting paperwork (Form 5800.1) to more systematically collect and analyze information on undeclared shipments. RSPA expects to complete this and other ongoing revisions to its incident-reporting form by spring 2003.

[10]Recently, RSPA received comments on the frequency of undeclared shipments in response to an advanced notice of proposed rulemaking. RSPA received these comments under Docket HM-228, which considers changes to the regulations on the transportation of hazardous materials. According to an RSPA official, the agency is analyzing these comments and expects to complete its analysis by the end of October 2003.

Technological, Economic, and Legal Hurdles Also Make Estimates of Undeclared Dangerous Goods Shipments Difficult

Technological limitations complicate efforts to estimate the incidence of undeclared dangerous goods shipments. Ideally, technologies generally considered to be less intrusive, such as X-ray or explosives-detection equipment, could be used to identify and characterize undeclared shipments. The Transportation Security Administration (TSA)[11] is currently using this equipment to screen passenger carry-on and checked baggage for weapons and explosives, and, under the Aviation and Transportation Security Act,[12] TSA must ensure that a system is in operation to screen, inspect, or otherwise provide for the security of all air cargo to be transported in all cargo aircraft as soon as practicable. However, X-ray and explosives-detection equipment is not designed to detect many types of dangerous goods.[13] In the future, technology may enable the rapid, less intrusive screening of packages, but in the near term, opening packages remains the best way to obtain information on the nature and frequency of undeclared shipments.

Economic obstacles—particularly the costs of opening packages after accepting them—also make it difficult to estimate the nature and frequency of undeclared dangerous goods shipments. According to each of the major carriers we interviewed, the volume of cargo that these airlines carry each day is tremendous. For example, the carriers stated that they carry from at least 1.3 million to more than 2 million shipments each night, a small fraction of which contain dangerous goods. Because the carriers typically guarantee delivery on nearly all of the shipments they carry (such as within 24 hours or 2 business days), anything that slows their ability to move shipments could compromise their ability to meet their guarantees to their customers and, as a result, hurt their competitive position in their industry.

Although the carriers we interviewed told us that they obtain the consent of shippers to open packages, they also said they seldom do open packages. Carriers and an association representing cargo and passenger airlines stressed that they are not in the business of opening packages, particularly when shippers are primarily responsible for ensuring the

[11]The Homeland Security Act of 2002, P.L. 107-296, provides that TSA be transferred to the Department of Homeland Security. The Under Secretary for Border Transportation and Security has responsibility for TSA.

[12]P.L. 107-71, November 19, 2001.

[13]We do not describe how this technology works because TSA considers this to be sensitive security information.

integrity and proper declaration of those packages. The carriers indicated that they have confidence in and place a great, ongoing emphasis on their up-front screening to prevent shippers from offering them undeclared dangerous goods in the first place. Opening packages without probable cause to do so would also be costly to the carriers because they would be responsible for repackaging anything they found to be properly declared—and dangerous goods require special, more expensive packaging than other shipments. Although carriers remain concerned about the possibility of undeclared shipments they may miss, to date the frequency with which they discover shipments of undeclared dangerous goods does not, in their view, justify a step as disruptive and costly as systematically opening a random or targeted selection of shipments.

Because the Fourth Amendment to the Constitution prohibits unreasonable searches and seizures and neither DOT nor the Postal Service has obtained the consent of owners to have their packages opened for inspection, neither agency may conduct or require random or targeted intrusive inspections of domestic cargo shipments to look for undeclared dangerous goods. Although FAA may remove a package from an aircraft and take such emergency actions if it reasonably believes that the package presents an immediate threat, it has no authority, generally, to open and inspect a package without a warrant or without the owner's consent.

The Postal Service may inspect Parcel Post packages. However, packages sent as First Class or Express mail traveling by air may not be inspected.[14] The mail classification schedule recommended by the Postal Rate Commission and adopted by the Postal Service does not distinguish between letters and packages, treating both as "sealed against inspection" and protected by the Fourth Amendment. Thus, these packages are protected to the same extent as letters, and all First Class and Express mail is treated as protected by the Fourth Amendment.

[14]The Postal Reorganization Act, 39 U.S.C. § 3623(d), addresses the issue of letters sealed against inspection. It states, "The Postal Service shall maintain one or more classes of mail for the transmission of letters sealed against inspection… No letter of such a class of domestic origin shall be opened except under authority of a search warrant authorized by law, or by an officer or employee of the Postal Service for the sole purpose of determining an address at which the letter can be delivered, or pursuant to the authorization of the addressee."

DOT Has Teamed with the U.S. Customs Service to Obtain Information on Undeclared Dangerous Goods in International Shipments

To obtain more information on the nature and frequency of undeclared dangerous goods in air transport, FAA has teamed with the U.S. Customs Service, which has the authority to inspect and search international cargo (imports and exports). Specifically, the Customs Service can and does randomly open and inspect international cargo for purposes such as ensuring that shippers have paid the proper tariffs. Most recently, in June and July 2000, the U.S. Customs Service and FAA together conducted inspections of passenger carry-on and checked bags and cargo aboard flights that were entering or departing from the United States at 19 domestic airports.[15] This series of inspections found that

- 8 percent of targeted cargo shipments (those whose tariff codes indicated that their contents might be hazardous) contained undeclared dangerous goods,
- 1 percent of passenger carry-on bags contained undeclared dangerous goods, and
- just under 0.5 percent of passenger checked baggage contained undeclared dangerous goods.

The undeclared dangerous goods in the cargo shipments included flammable liquids, fuel control units, aerosols, fire extinguishers, and devices powered by flammable liquid. In the passengers' checked and carry-on bags, the Customs-FAA teams found aerosols, lighters, flammable liquids, safety matches, compressed flammable gases, and automotive batteries. The Customs-FAA team randomly selected the passenger baggage it inspected, but for the cargo, the team matched tariff codes for commodity imports and exports with a dangerous goods trigger list to determine which shipments to inspect.[16]

[15] *Final Report of Operation Clear Sky*, Joint Inspection Activity, United States Customs Service/Federal Aviation Administration, June 26–July 21, 2000.

[16] The Customs-FAA inspections focused on international cargo and passenger baggage because the Customs Service has the authority to open and inspect shipments coming into or leaving the United States. Beyond the border, neither agency has the authority to open and inspect domestic cargo or passenger baggage without a search warrant.

Increased Inspection Authority That DOT Is Seeking Would Not Produce Statistically Valid Data and Does Not Distinguish between Air and Other Modes of Transportation

DOT has tried several times to clarify and expand its authority to inspect and open certain packages when its inspectors suspect a violation of the dangerous goods regulations. In its 1997, 1999, and 2001 reauthorization proposal, DOT sought the authority to access, open, examine, and, if need be, remove a package from transportation if it had an objectively reasonable and articulable belief that the package might contain undeclared dangerous goods.[17] According to DOT, this authority, which is specific to all modes, would require its officers or inspectors to have a "particularized and objective basis" for suspecting a violation, such as a pattern of shipping undeclared dangerous goods, in order to open an unmarked package. DOT further stated that this enhanced authority would enable it to more effectively detect potential violations and to ensure that it took the appropriate remedial actions. According to DOT officials, its reauthorization proposal has not been enacted for reasons unrelated to the merits of its request for additional inspection authority.

Because DOT's reauthorization proposal applies equally to all modes of transportation, it would, if approved, allow DOT to follow up on problem shippers across the modes. However, the proposal would also extend the government's inspection authority without regard to the differences inherent in transporting dangerous goods by different modes. The same distinctions between air and the other modes that justify more stringent regulations for transporting dangerous goods by air might also justify greater inspection authority for packages shipped by air.

A primary objective of DOT's reauthorization proposal has been to improve the ability of its inspectors to monitor and enforce the dangerous goods regulations. The proposal has not been designed to obtain better information about the nature and frequency of undeclared air shipments. Because it would require a "particularized and objective basis" for opening packages, it would not allow DOT to identify a random sample of packages and conduct inspections whose results could be generalized to all packages in air transport. Thus, its usefulness as a tool for gathering data to estimate the nature and frequency of undeclared air shipments and to profile and target violators would be limited. DOT officials agree that their proposal would not generate statistically valid data, and they have indicated their willingness to modify the proposal so that it would yield more useful information.

[17]In this report, we are not expressing an opinion on potential constitutional issues related to DOT's proposal.

An alternative to DOT's proposal, based on the premise that additional and perhaps unique measures are needed to protect air commerce, would require that shippers consent to DOT's opening packages shipped by air for inspection. This would allow the department to select and open a random sample of packages in order to gather statistically valid data on undeclared air shipments.

Government and Industry Rely on Several Mechanisms to Prevent Dangerous Goods Shipments from Compromising Safety

To prevent dangerous goods shipments from compromising aviation safety, the federal government relies on regulation, research, and outreach, while private industry depends on policies for dealing with known shippers, other restrictions, training, and sanctions.

The Federal Government Depends on Regulations, Research, and Outreach to Prevent Problems

Federal regulations provide a framework for transporting dangerous goods safely by air. As discussed in the background section of this report, these regulations define dangerous goods, identify those that may and may not travel by air, and specify how the materials are to be packaged, handled, and carried. In addition, the regulations prescribe initial and recurrent training for shippers' and carriers' employees, and require shippers and carriers to test their employees' understanding of the material covered in the training. The training, which is designed to increase dangerous goods employees' safety awareness and to reduce the frequency of dangerous goods incidents, is important because insufficient understanding of the rules is often a factor contributing to such incidents. For example, in 17 of 25 dangerous goods enforcement cases we reviewed involving businesses, FAA identified employees' lack of training as a contributing factor.[18]

To monitor the effectiveness of its regulations in promoting safety, RSPA collects information on dangerous goods incidents occurring in the air,

[18]The remaining 5 cases of the 30 we reviewed involved individuals not engaged as HAZMAT employees, to whom the rules regarding initial and recurrent training do not apply.

water, rail, and truck modes through its Form 5800.1. Nonetheless, the form is not designed to collect all the information that would be useful in monitoring the effectiveness of DOT's dangerous goods regulations. As previously noted, the form does not ask whether a problem shipment was declared or undeclared—a key question in assessing effectiveness. [19] In addition, the form does not include data fields that precisely identify the different types of packaging deficiencies. While the form has space for written comments, there is no mechanism for standardizing and entering the information from the comments into DOT's databases. RSPA is revising the form to overcome these limitations. Once carriers begin collecting information on dangerous goods incidents using this revised form, better information on the incidence of undeclared shipments and reasons for packaging deficiencies should be available to FAA and the other operating administrations.

In the course of such monitoring, DOT sometimes identifies safety issues that require further research. For example, DOT is currently evaluating ways in which it will strengthen the regulations for shipping batteries, because its analysis indicated that the existing dangerous goods regulations for these shipments may not be sufficient. Beginning in the early 1990s, FAA identified a number of incidents associated with batteries, particularly lithium batteries, aboard aircraft in which the batteries caused fires, smoke, or extreme heat—precisely the kind of effects that make dangerous goods dangerous. In response to these and other concerns, RSPA has taken a number of actions designed to improve the regulations for the transportation of lithium batteries.[20]

FAA's monitoring of reports on incidents involving dangerous goods also led to further work on packaging standards. In examining nearly 3,000 reports from 1998 and 1999, FAA found that 60 percent of the incidents involved properly declared shipments, indicating that the shipments

[19]Two DOT initiatives—the Flagship Initiative on Hazardous Materials Handling/Incidents and the DOT-wide program evaluation—cited a better understanding of the frequency and impact of undeclared shipments as essential.

[20]In response to an incident at Los Angeles International Airport in 1999, the National Transportation Safety Board issued five safety recommendations to RSPA for improving the transportation of lithium batteries. In response to these concerns, RSPA published safety advisories in the *Federal Register*, worked with the lithium battery industry to adopt voluntary safety standards, undertook a study on the transportation of lithium batteries, and initiated changes to domestic and international regulations on the transport of lithium batteries.

complied with the existing packaging standards. Yet just over half (873) of these properly declared shipments had problems because their packaging failed—that is, their closures or seals leaked. These data prompted FAA to attempt to determine the adequacy of packaging standards for air transportation and the likely causes of leaking closures and seals. Observing an increase in the number of package failures in the past 3 years, FAA questioned whether the existing test methods simulate the realistic combined effects of pressure, temperature, and vibration. As a result, FAA contracted with Michigan State University to study packaging in air transportation. The results of that study, which FAA recently received, indicate that closures are continuing to leak in packages marked as complying with existing packaging standards. Subjecting packages to both high altitude and vibration resulted in a package failure rate of 50 percent. RSPA is reviewing these results.

To help prevent dangerous goods incidents aboard passenger aircraft, FAA and RSPA conduct outreach to the public. For example, FAA worked with RSPA to develop for air travelers a brochure that lists items prohibited in passenger baggage (see app. I). The brochure also explains that in-flight variations in temperature and pressure can cause seemingly harmless items to leak or generate toxic fumes during air travel. RSPA requires that signs be posted in airport terminals and at check-in counters listing items prohibited in air travel, some of which passengers may not recognize as hazardous in air transportation. In addition, FAA has placed kiosks with information on dangerous goods at 24 major airports to better inform the general public about items that are considered hazardous onboard aircraft.

The Postal Service also does consumer outreach to better inform the public about the materials that may and may not be sent through the mail. According to Postal Service officials, there are posters in all of its facilities that warn customers about shipping restricted dangerous goods. In addition, for any customer who ships or requests information about shipping dangerous goods, Postal Service retail employees provide an informational brochure summarizing the applicable rules as well as the shipper's responsibilities.

Major Carriers Rely on Known Shipper Policies, Other Restrictions, Training, and Sanctions to Prevent Undeclared Shipments

To prevent undeclared dangerous goods shipments, major carriers limit their business to known shippers and may impose other restrictions. They also train their employees to be a first line of defense against undeclared shipments, and may apply sanctions to shippers who have violated dangerous goods regulations.

Carriers Deal with Known Shippers and Impose Other Restrictions

To ensure that they are dealing with legitimate businesses that are more likely to properly train their employees to comply with dangerous goods rules, the major carriers we interviewed rely on TSA's "known shipper" requirements or establish formal, contractual relationships with their shippers that mirror the known shipper requirements.[21] According to officials of one of the carriers, the steps involved in becoming a known shipper reduce to an acceptable level the risk that the shipper presents to the carrier.[22] By contrast, the carriers have found, casual or one-time shippers are more likely to offer undeclared dangerous goods for shipment. Three of the four carriers said they try to limit their business with casual or one-time shippers and do not advertise to them. Rather, two of the carriers said, they target business-to-business shippers that typically have experience with shipping high volumes of dangerous goods and may have long-standing relationships with the carriers. The fourth carrier said that it does not accept dangerous goods from casual shippers at all and, for other shippers, requires the establishment of a dangerous goods–shipping agreement, or contract, that spells out obligations for shippers, such as recurring employee-training requirements. Officials of this carrier believe that these contractual obligations reduce the incidence of undeclared shipments.

[21]We have not included a detailed description of the criteria that shippers must meet for carriers to consider them "known" because TSA considers this to be sensitive-security information.

[22]Recent media reports as well as work by the DOT Inspector General have raised concerns about the extent to which (1) the known shipper procedures are a reliable deterrent to criminal attacks and (2) selected carriers were adequately complying with regulations requiring them to, among other things, properly screen packages from unknown shippers. Most recently, virtually all of the cargo carriers the Inspector General tested were complying with the requirement, put in place after September 11, 2001, to take no packages from unknown shippers. However, the Inspector General raised additional serious concerns about weaknesses in FAA's procedures for individuals or businesses to become approved indirect air carriers. (A carrier using the known shipper requirements must verify that shippers have such approval from FAA.)

Besides limiting their business primarily to known shippers, the major carriers we interviewed may try to prevent undeclared shipments by limiting the types of materials they will carry and the places where they will accept dangerous goods shipments. Three of the four carriers said they accept fewer types of dangerous goods for shipment than DOT authorizes to travel by air. For example, the carriers said they refuse to carry materials such as toxic or infectious substances, certain explosives, and organic peroxides. In addition, one of the carriers said it would not accept dangerous goods shipments at its retail establishments. This carrier said it would accept such shipments only when its own drivers picked them up from established customers. This carrier's policy is designed to screen out the casual shippers that might use its retail establishments. According to the carrier, this policy also allows it to rely on its drivers' experience with dangerous goods shipments, their training, and their long-standing relationships with established customers as a first line of screening against undeclared shipments of dangerous goods.

While the Postal Service cannot limit its business to known shippers, it accepts fewer dangerous goods for shipment than DOT authorizes to travel by air. In general, the Postal Service limits the dangerous goods it will accept for shipment to certain quantities of consumer commodities that typically present a limited hazard in transportation because of their form, quantity, or packaging.

In addition to limiting what dangerous goods it will carry, the Postal Service, as part of its aviation mail security program, requires customers to bring any package weighing 16 ounces or more to a post office for shipment. The intent of this program is to prevent explosives in the mail, but Postal Service officials indicated it has a residual benefit in helping to prevent undeclared shipments of dangerous goods. Specifically, by requiring customers to bring packages that weigh 16 ounces or more to a post office for shipment, Postal Service employees can inspect packages, ask questions about their contents to determine whether they contain anything prohibited, and ensure proper handling for packages containing dangerous goods that may be mailed.

Carriers Train Their Employees to Monitor Compliance with Dangerous Goods Requirements

The major carriers we interviewed emphasized that the training they provide for their employees is a key component in their efforts to prevent shippers from offering undeclared dangerous goods, supplementing their use of restrictions or the known shipper requirements to guard against such shipments. This training provides information on dangerous goods requirements and procedures for drivers and employees who handle, sort, and load shipments. Through this training, the carriers expect that

employees throughout their distribution chain will be able to identify problems such as declaration paperwork that is missing information about the contents of a package labeled as dangerous.

Carriers rely particularly on their drivers to draw on their training to, in effect, extend the known shipper concept to their day-to-day interactions with shippers. Training, plus a working knowledge of a company's established customers, helps the drivers detect inadvertent failures to properly declare a shipment. For example, a driver picking up a shipment from a customer who typically sends some dangerous goods would be expected to raise questions if the customer did not label or declare any of the packages as dangerous. In such an instance, the shipper may have made a mistake or forgotten to declare the dangerous goods.

The Postal Service trains its retail employees, who accept packages from the public, to screen packages and prevent those with undeclared or improperly packaged dangerous goods from entering the mail system. According to Postal Service officials, as of August 2002, the agency had trained all 131,000 of its retail employees in procedures for preventing the acceptance of any package containing prohibited materials. These procedures include (1) asking shippers a series of questions about the contents of their packages, including whether the packages contain anything hazardous; (2) visually inspecting packages to look for signs of problems, such as leaks, the lack of a return address, or markings indicating that a package contains something a shipper may not know is hazardous; and (3) referring to a reference guide for assistance in answering shippers' questions about items that may or may not be permissible in the U.S. mail. (See app. II for a summary of DOT's dangerous goods classes and the materials or quantities from each that are allowed in the U.S. mail.) While the retail employees may be the first to deal with shipments entering the mail system, the Postal Service also provides dangerous goods training to its non-retail employees (such as postal inspectors or employees at business mail entry units), who also handle or carry dangerous goods or respond to incidents involving them.

According to the official responsible for the Postal Service's dangerous goods program, the agency has to rely on its retail employees to screen out unacceptable items because it has limited authority to open mail that has been accepted for shipment. These officials believe that face-to-face questioning reduces the anonymity associated with depositing a letter in a mailbox. And reducing anonymity, this official says, improves their confidence in shippers' statements about the contents of packages. To test its retail employees' performance in specific aspects of customer service,

the Postal Service has an ongoing "mystery shopper" program in which its employees pose as customers. In late 2001, the Postal Service began including in the mystery shopper tests a determination of whether the retail employees were following requirements for asking the question about dangerous goods. To date, the Postal Service's tests indicate that the retail employees asked the required screening question 69 percent of the time. When the retail employees failed to ask the dangerous goods question, Postal Service officials said they provided feedback and retrained the employees. These officials also told us that they provided this feedback to each postal office manager and have incorporated targets for improved performance on the mystery shopper tests into the managers' performance goals. Officials say these results are slowly and steadily improving.

Carriers May Impose Sanctions for Shipping Undeclared Dangerous Goods

A shipper who fails to properly declare a dangerous goods shipment can face serious consequences from a major carrier, particularly if the shipper is a business or other operation with an ongoing need for the carrier's services. Two of the major carriers we interviewed may, depending on the seriousness of the violation, require a shipper to provide additional remedial training in shipping dangerous goods; apply more stringent terms for accepting shipments from the shipper; or, in more serious instances, permanently terminate the business relationship with the shipper. Officials from one of the carriers stated that their company's requirements for remedial training in these instances exceed DOT's requirements for shippers. Similarly, officials from another carrier told us that an inadvertent violation of the rules governing the declaration of dangerous goods would, in most cases, result in a minimum suspension of 60 days, pending the shipper's completion of training or any other steps the carrier chose to require before again accepting packages from that shipper. This same carrier's officials said that when they suspect that a shipper may have sent undeclared dangerous goods through their system, they will begin an investigation to determine whether the shipper knew or should have known that it was doing so. Until the carrier completes that investigation, the shipper must agree to let the carrier's staff open and inspect every shipment before accepting it. If this carrier determines that the shipper knowingly offered undeclared dangerous goods, it terminates its business with that shipper.

For DOT, Inadequate Documentation, and for the Postal Service, Lack of Civil Penalty Authority Hamper Enforcement of Dangerous Goods Regulations

To evaluate the effectiveness of and to enforce federal regulations for shipping dangerous goods by air, DOT collects data on dangerous goods incidents, monitors shippers' and carriers' performance, and assesses civil penalties. Within DOT, FAA is primarily responsible for enforcing the regulations for transporting dangerous goods by air. To ensure that the penalties it imposes for violations of dangerous goods regulations are appropriate to shippers' and carriers' complete compliance histories, FAA, together with DOT's other affected operating administrations, is required to consider the compliance history of violators in all modes of transportation when assessing penalties against them. This guidance was difficult for FAA and others to follow because, until very recently, with the exception of RSPA, DOT's operating administrations were not submitting their enforcement data in a timely manner to DOT's centralized enforcement database. Finally, to further ensure that appropriate civil penalties are assessed and that similar cases are treated consistently and fairly, FAA requires that the reasons for any reduction to a recommended civil penalty be documented. Our analysis of FAA's enforcement case files found that FAA is not always documenting its assessments.

Like DOT, the Postal Service collects data on dangerous goods incidents, but it lacks DOT's authority to assess civil penalties for violations and therefore takes few enforcement actions. Legislation proposed by DOT would allow the Postal Service to assess civil penalties.

FAA Collects Data to Monitor and Enforce Compliance

To monitor and enforce compliance with DOT's dangerous goods regulations, FAA collects data on dangerous goods air incidents and discrepancies through its Airport and Air Carrier Information Reporting System (AAIRS). RSPA's regulations define incidents as reportable releases of hazardous materials, including those that are unintended and unanticipated. "Discrepancies" are defined in the Hazardous Materials Regulations (HMR) as instances in which dangerous goods are found to be undeclared, misdeclared, or improperly packaged.[23] In addition, FAA collects data on closed dangerous goods enforcement cases through its

[23]An incident is defined in RSPA's regulations as an event that results in a reportable release of a hazardous material, including unintended and unanticipated releases that otherwise require reporting under 49 C.F.R. §171.15 or §171.16. As used in the Hazardous Materials Regulations, the term "discrepancies" describes instances of undeclared dangerous goods (material found in transportation that was not identified as dangerous goods) and instances of misdeclared or improperly packaged dangerous goods.

Enforcement Information System. (See app. III for more information about FAA's and DOT's incident and enforcement databases.)

FAA Could Not Readily Consider Complete Compliance Histories When Assessing Penalties

To ensure that appropriate civil penalties are assessed, FAA's enforcement guidance requires the agency to consider the compliance history of violators across all modes of transportation. Until recently, FAA had difficulty complying with this guidance because, with the exception of RSPA, DOT's operating administrations were not submitting their closed enforcement action data in a timely manner to a central database—the Unified Shipper Enforcement Data System (UNISHIP), maintained by RSPA. DOT developed this database in response to a 1991 GAO report.

RSPA is working with DOT's affected operating administrations to ensure the timely submission of enforcement data. On July 17, 2002, the Office of the Secretary of Transportation issued a memorandum calling for the implementation of required procedures for entering data on dangerous goods enforcement actions into UNISHIP. If the database is kept up to date, FAA inspectors can obtain compliance information by querying the central database.

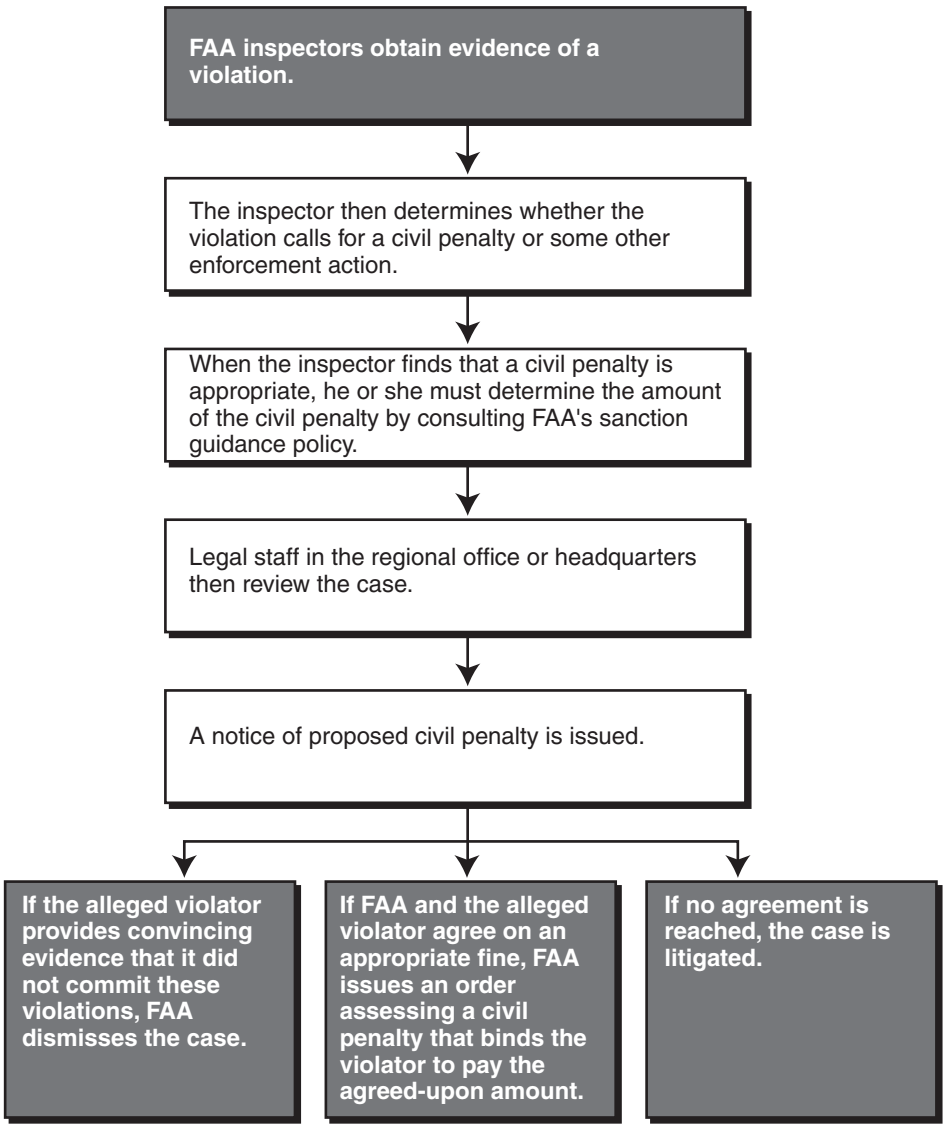
FAA Is Not Documenting Changes to Recommended Civil Penalties as Required

Our analysis of FAA's case files indicates that FAA is not always documenting the reasons for reductions to recommended civil penalties, as its guidance requires. We found cases in which the proposed civil penalty was changed, but either no documentation or incomplete documentation was provided to explain the reasons for the reduction. An FAA official stated that it was FAA's policy to include documentation for civil penalty changes in the case files. To help ensure that appropriate civil penalties are assessed and that similar cases are treated consistently and fairly, it is important that FAA document the reasons for any reduction to a recommended civil penalty.

The enforcement process begins when FAA inspectors obtain indication of a violation (see fig. 4.). The inspector then determines whether the violation warrants administrative action (such as a warning notice or letter of correction), legal enforcement action (such as the imposition of a civil penalty), or referral for criminal prosecution. When the inspector finds that a civil penalty is appropriate, he or she must determine the amount of the civil penalty by consulting FAA's sanction guidance policy. Legal staff in the regional office or headquarters then review the strength of the evidence, the type of enforcement action, and the amount of the civil penalty, if any. Next, a notice of proposed civil penalty is issued that is

consistent with the inspector's report and the review. The alleged violator then has an opportunity to reply to the civil penalty assessed. If the alleged violator provides convincing evidence that it did not commit the violation, FAA dismisses the case. If FAA and the alleged violator agree on an appropriate fine, FAA issues an order assessing a civil penalty that binds the violator to pay the agreed-upon amount. If no agreement is reached, the case is litigated.

Figure 3. FAA's Dangerous Goods Enforcement Process (for Civil Penalty Cases)



Source: Federal Aviation Administration.

In 15 of the cases we reviewed, the assessed civil penalty differed from the proposed civil penalty, but FAA included either no documentation or incomplete documentation in the case files to account for the changes. For example:

- In 2000, the assessed civil penalty on a chemical company for not properly shipping flammable paint was reduced from $75,000 to $15,000, but no reason was provided in the file for the change.

- In 2000, the assessed civil penalty on a paint company for not properly shipping flammable paint was reduced from $59,500 to $37,500, but no reason was provided in the file for the change.

In addition, in one case involving the shipment of an oxygen generator by an air carrier in 1997, the recommended civil penalty was reduced by 20 percent, even though oxygen generators were responsible for the ValuJet aircraft crash in 1996. This penalty was reduced for reasons that were not documented. The reduction was not consistent with the known risks of oxygen generators.

Postal Service Lacks Authority to Impose Civil Penalties for Violations

The Postal Service's standards for mailing dangerous goods are similar to DOT's detailed specifications for packaging, marking, and labeling dangerous goods, although the mail is subject to many additional limitations and prohibitions, which are imposed by provisions of criminal statutes.[24] Yet in contrast with DOT, which can assess civil or pursue criminal penalties for violations of its standards, the Postal Service can only pursue criminal penalties. This leads to little enforcement, because many violations are unintentional and involve situations that are inappropriate for criminal sanctions. At the same time, the high cleanup and damage costs associated with dangerous goods violations are time-consuming, and damages may be difficult to recover absent authority to assess civil penalties. For example, in a 1998 incident, the Postal Service incurred costs of $87,000 and the carrier incurred damages of $1.4 million when a Priority mail shipment containing four bottles of mercury was found to be leaking upon removal from the aircraft. Another costly incident occurred in 2000, when 3 gallons of gasoline were illegally shipped in a motorcycle gas tank and the tank leaked during the flight, requiring the plane to be taken out of service and cleaned. As part of its

[24]The mail is subject to the restrictions in title 18 that prohibit the mailing of any matter that is outwardly or of its own force dangerous to life, health, or property, and to restrictions defined in the Postal Service's rules. However, the Postal Service is not subject to the Hazardous Materials Transportation Act or to the HMR. We also note that while commercial carriers are subject to the federal regulations set forth in title 49, C.F.R., the Postal Service operates under title 39, C.F.R. The USPS hazardous material regulations are set forth in the *Domestic Mail Manual* (39 C.F.R. Part 111) and further explained in Publication 52, *Hazardous, Restricted, and Perishable Mail.*

proposal to reauthorize the hazardous materials transportation program, DOT has included a provision that would allow the Postal Service to collect civil penalties and to recover costs and damages for dangerous goods violations.[25] The Postal Service has been actively working with DOT, and it supports this provision. Yet others have raised concerns about possible conflicts between the Postal Service's current law enforcement authority and its effect on fair competition between the Postal Service and other shippers. The question of whether changes should be made regarding the Postal Service's law enforcement responsibilities continues to be discussed as the Congress and others revisit the Postal Service's mission and roles as part of broader postal reform efforts.

Conclusions

Without statistically valid, generalizable data on the nature and frequency of undeclared dangerous goods in air transport, DOT does not know to what extent such goods pose a threat to aviation safety, or what resources should be allocated to address that threat. Eventually, affordable diagnostic screening technologies may enable carriers and DOT to monitor dangerous goods shipments efficiently and nonintrusively. Until then, greater inspection authority would enable DOT to randomly select and open packages; gather statistically valid, generalizable data; and profile and target potential violators, thereby possibly enhancing aviation safety. A change in the law requiring that shippers consent to the inspection of packages shipped by air might help to accomplish these objectives. The legislation that DOT has proposed seeking greater inspection authority has not to date been limited to the air mode and has not been designed to obtain statistically valid data. However, the distinctions between air and the other modes that justify more stringent regulations for transporting dangerous goods by air, along with the potential benefits to aviation safety that could accrue from better data on undeclared air shipments, might warrant the development of a proposal that would enable DOT to obtain such data.

The Office of the Secretary's recent memorandum to the operating administrations, calling for the timely submission of closed enforcement action data to DOT's centralized enforcement database, should strengthen FAA's ability to take appropriate enforcement action against violators of DOT's dangerous goods regulations. Provided that the operating

[25]S. 1669 and H.R. 3276, Hazardous Material Transportation Safety Reauthorization Act of 2001.

administrations continue to follow the memorandum, FAA should be able to identify high-risk or problem entities, consider their compliance histories in all modes of transportation as its enforcement policy guidance requires, and ensure that the penalties it assesses against them are appropriate to their histories. Yet FAA still needs to do more to demonstrate that it has assessed appropriate civil penalties. Until it fully documents the reasons for its assessments, or for changes to its initial assessments, as its guidance requires, it cannot provide assurance that the penalties are appropriate or that it has handled similar cases consistently.

Recommendations for Executive Action

In order to strengthen DOT's enforcement of dangerous goods regulations, we recommend that the Secretary of Transportation determine whether the unique characteristics of air transport warrant the development of a legislative proposal that would enhance DOT's authority to inspect packages shipped by air.

Depending on the results of his determination, we further recommend that the Secretary direct the FAA Administrator to develop a legislative proposal that would require shippers to consent to the opening for inspection of packages shipped by air. Such a proposal would not only enhance FAA's inspection authority but would also enable FAA to obtain statistically valid, generalizable data on the nature and frequency of undeclared air shipments of dangerous goods.

Finally, we recommend that the Secretary direct the Administrator to ensure that FAA better communicate and enforce its requirement to document the justification for any substantial changes to an initially proposed penalty before issuing a final order assessing a penalty.

Agency Comments and Our Evaluation

We provided DOT and the U.S. Postal Service with a draft of this report for their review and comment. We met with DOT officials, including the Director of RSPA's Office of Hazardous Materials Enforcement and the Manager of FAA's Dangerous Goods and Cargo Security Enforcement Program, to receive their comments. The U.S. Postal Service provided comments via E-mail. DOT and the Postal Service generally agreed with our report and provided clarifying and technical comments, which we incorporated as appropriate.

In our draft report, we recommended that the Secretary of Transportation direct the DOT administrations that operate and manage a dangerous goods program to submit their enforcement data to RSPA's centralized

database. According to our audit work, the administrations were not submitting the data and, therefore, FAA could not readily comply with its guidance requiring it to consider the compliance history of violators in all modes of transportation. However, when we discussed the draft report with DOT officials in October 2002, they provided a July 17, 2002, memorandum from the Office of the Secretary of Transportation directing the operating administrations to submit the data. In addition, in October 2002, DOT furnished evidence that three of the five administrations subsequently provided current data. We therefore deleted this recommendation from the final report. DOT agreed with our other recommendations, acknowledging that its legislative proposals seeking greater inspection authority have not been designed to obtain statistically valid data on undeclared shipments of dangerous goods. DOT further noted that FAA's upcoming reauthorization legislation could serve as a vehicle for a proposal to expand FAA's inspection authority, so that the agency could obtain better data on undeclared air shipments. While indicating that changes to initially proposed civil penalties sometimes occur as a result of penalty negotiations, DOT agreed that documenting the justification for changes is important for providing assurance that final penalties are appropriate and consistent.

Scope and Methodology

To determine what DOT, the Postal Service, and others involved in the air transport of dangerous goods know about undeclared shipments, we identified relevant studies and interviewed DOT, Postal Service, industry, and industry association officials. We reviewed the documents and reports we obtained, visited DOT's John A. Volpe National Transportation Systems Center and FAA's William J. Hughes Technical Center, and conducted additional interviews with the researchers who had carried out critical studies. We also interviewed officials at four of the major cargo carriers, and conducted site visits at three of their facilities.

To determine the key mechanisms that the federal government and private industry have in place to prevent dangerous goods from compromising safety, we interviewed agency and industry officials and federal researchers. We also reviewed relevant reports and documents in order to identify recent developments in screening technology.

To determine what DOT and the Postal Service do to foster compliance with federal regulations for shipping dangerous goods by air, we interviewed agency officials and reviewed reports and documents. We also examined FAA's practices for assessing civil penalties by testing 30 randomly selected cases from FAA's Enforcement Information System,

which contains a database of over 2,000 cases.[26] These cases were randomly selected to fairly represent the full range of over 2,000 cases in the database. While the number of cases we tested was too small to enable us to estimate the extent to which FAA's enforcement strategy was followed in the entire database, these 30 cases permit us to describe the types of practices that occur at critical points in the penalty assessment process.

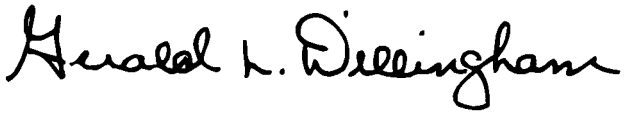
We performed our work from September 2001 through November 2002, in accordance with generally accepted government auditing standards.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to the Chairman and the Ranking Minority Member of the House Committee on Transportation and Infrastructure, and the Chairman of its Subcommittee on Aviation; other appropriate congressional committees; the Secretary of Transportation; the Postmaster General, United States Postal Service; the Under Secretary of Transportation for Security, Transportation Security Administration; the Administrator, Research and Special Programs Administration; and the Administrator, Federal Aviation Administration. We will also make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at http://www.gao.gov.

[26]The Enforcement Information System contains entries of violations found during inspections or through other means (such as police inspections or public complaints) that initiate enforcement cases. It contains detailed information on the status and resolution of each enforcement case and allows field, regional, and headquarters staff to enter and retrieve data.

Please call me at (202) 512-2384 if you or your staff have any questions about the information in this report. Key contributors to this report are listed in appendix IV.

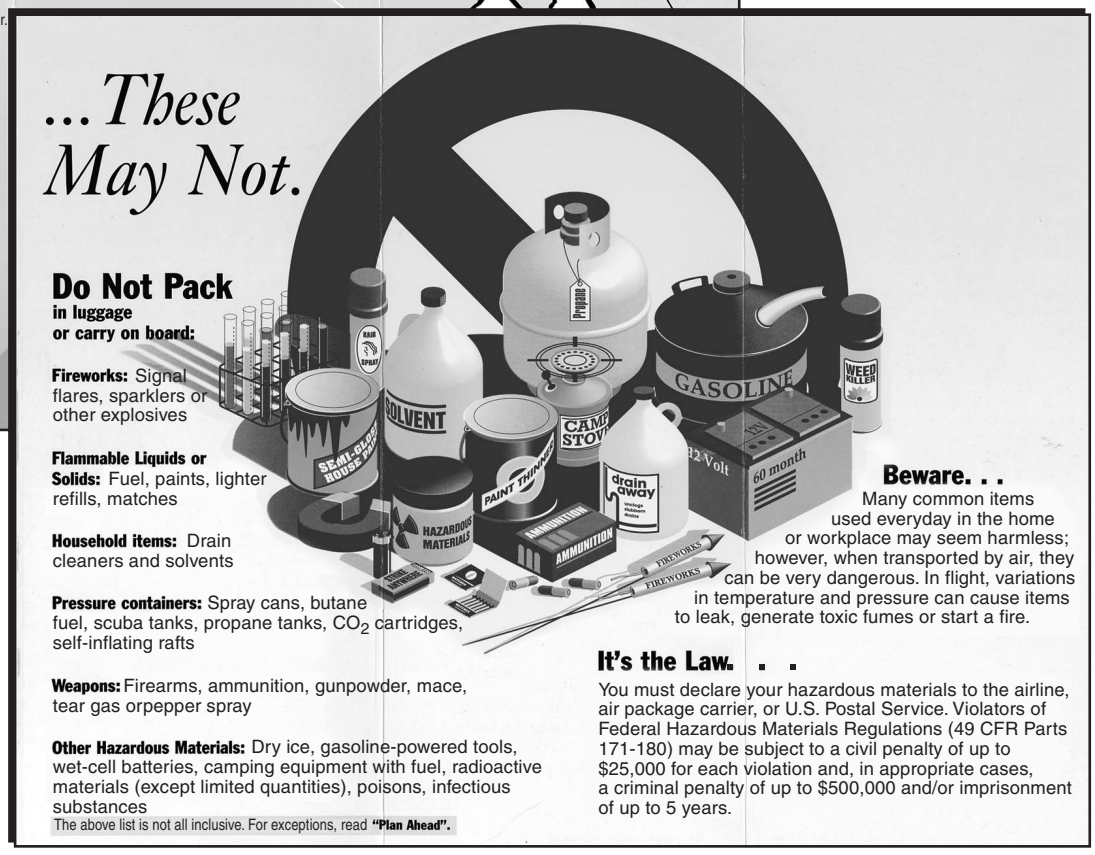
Sincerely yours,



Gerald L. Dillingham, Ph.D.
Director, Physical Infrastructure

Appendix I: FAA's Dangerous Goods Informational Brochure for Passengers

Brochure outside



Brochure inside

Source: Federal Aviation Administration and Research and Special Programs Administration.

Appendix II: Mailability of Dangerous Goods, by DOT Class

Exhibit 1.3 **DOT Hazard Classes and Mailability Summary**

Class	Hazard Class Name and Division	Domestic Mail Air Transportation	Domestic Mail Surface Transportation	International Mail
1	**Explosives** Division 1.1 Mass Explosive Hazard Division 1.2 Projection Hazard Division 1.3 Fire Hazard and/or Minor Blast/Minor Projection Hazard Division 1.4 Minor Blast Hazard Division 1.5 Very Insensitive With Mass Explosion Hazard Division 1.6 Extremely Insensitive With No Mass Explosion Hazard	Prohibited	Prohibited except with written permission as allowed in 2.2	Prohibited
2	**Gases** Division 2.1 Flammable Gases Division 2.2 Nonflammable, Nontoxic Gases Division 2.3 Toxic Gases	Division 2.1 and 2.3: Prohibited. Division 2.2: Only ORM-D material per 3.3	Divisions 2.1, 2.2: Only ORM-D material per 3.3. Division 2.3: Prohibited	Prohibited
3	**Flammable and Combustible Liquids**	Flammable liquids: Prohibited. Combustibles: Only ORM-D material per 4.3	Flammable liquids: Only ORM-D material per 4.2. Combustibles: Only ORM-D material per 4.3	Prohibited
4	**Flammable Solids** Division 4.1 Flammable Solids Division 4.2 Spontaneously Combustible Division 4.3 Dangerous When Wet	Prohibited	Only ORM-D material per 5.2	Prohibited
5	**Oxidizing Substances, Organic Peroxides** Division 5.1 Oxidizing Substances Division 5.2 Organic Peroxides	Only ORM-D material per 6.2	Only ORM-D material per 6.2	Prohibited
6	**Toxic Substances and Infectious Substances** Division 6.1 Toxic Substances Division 6.2 Infectious Substances	Division 6.1: Only ORM-D material per 7.2. Division 6.2: Only per 8.0	Division 6.1: Only ORM-D material per 7.2. Division 6.2: Only per 8.0	Division 6.1: Prohibited. Division 6.2: Only mailable per IMM 135
7	**Radioactive Materials**	Prohibited	Only in limits per 9.0 and Publication 52	Only mailable in limits per IMM 135
8	**Corrosives**	Only ORM-D material per 10.2	Only ORM-D material per 10.2	Prohibited
9	**Miscellaneous Hazardous Materials**	Only ORM-D material per 11.0	Only ORM-D material per 11.0	Prohibited, except magnetized materials per IMM 136

Source: United States Postal Service, *Domestic Mail Manual (DMM)*, C023.

Appendix III: Data Collected by DOT Agencies on Dangerous Goods Incidents and Enforcement Actions

FAA collects data on dangerous goods air incidents, discrepancies, and enforcement actions through two databases. Its Airport and Air Carrier Information Reporting System (AAIRS) collects basic incident and discrepancy information such as the mode, date, and location of the incident or discrepancy, the carrier and shipper involved, the hazard class of the spilled material, and the consequences of the incident or discrepancy. (See table 1.) FAA's Enforcement Information System (EIS) collects information on closed dangerous goods enforcement cases. It contains data such as the incident date, the regulations violated, the sanction initially recommended, and the final sanction. These enforcement data are used to monitor and enforce compliance with DOT's dangerous goods regulations.

Table 2: DOT Databases Tracking Information on the Air Transportation of Dangerous Goods

Database name	Database custodian	Description
Hazardous Material Incident Reporting System (HMIRS)	RSPA	DOT's HMIRS is the primary source of national incident data for the federal, state, and local government agencies responsible for the safety of dangerous goods transportation. Carriers of dangerous goods supply these data through their reporting of dangerous goods incidents.
Unified Shipper Enforcement System (UNISHIP)	RSPA	UNISHIP contains information on closed enforcement actions taken against shippers and freight forwarders in all modes of transportation, including air.
Airport/Air Carrier Information Reporting System (AAIRS)	FAA	AAIRS has been used since 1996 to track inspections of airports and air carrier stations. It includes dangerous goods incidents (which are also reported to HMIRS) and discrepancies (dangerous goods discoveries that occur through avenues other than faulty packaging, such as luggage inspection).
Enforcement Information System (EIS)	FAA	The EIS contains entries of violations found during inspections or through other means (such as police inspections or public complaints) that initiate enforcement cases.

Source: RSPA and FAA.

RSPA collects dangerous goods incident and enforcement data through two databases. Its Hazardous Materials Incident Reporting System (HMIRS) collects dangerous goods incident information across all transportation modes, not just the air mode. This information is similar to that collected in FAA's AAIRS database, but it does not include

discrepancies. RSPA tracks closed hazardous materials enforcement cases through its Unified Shipper Enforcement System (UNISHIP). This database tracks closed enforcement actions across all transportation operating administrations, not simply air.

RSPA collects data on dangerous goods incidents from all transportation modes through DOT Form F 5800.1, which captures basic information on incidents such as the mode, date, and location of the incident; the carrier and shipper involved; the hazard class and shipping name of the spilled material; and the consequences of the incident (including deaths, injuries, product loss, and damage). RSPA uses the data and the information it collects on dangerous goods incidents to (1) evaluate the effectiveness of existing regulations, (2) assist in determining the need for regulatory changes to cover changing transportation safety problems, and (3) determine major problem areas so that attention can be more suitably directed to them. In addition, both the government and industry use this dangerous goods incident information to chart trends and identify training inadequacies and packaging deficiencies.

In addition to RSPA, UNISHIP serves the enforcement programs of the Federal Aviation Administration, the Federal Railroad Administration, the Federal Motor Carrier Safety Administration, the U.S. Coast Guard, and the Inspector General by providing a history of compliance for the companies contained in the system.

Appendix IV: GAO Contacts and Staff Acknowledgments

GAO Contacts

Gerald L. Dillingham, Ph.D., (202) 512-2834
Belva M. Martin, (202) 512-2834

Acknowledgments

In addition to those named above, Elizabeth R. Eisenstadt, Arthur L. James, Bert Japikse, David Laverny-Rafter, Bill MacBlane, Kieran McCarthy, Richard Scott, and Katherine Wulff made key contributions to this report.

GAO's Mission

The General Accounting Office, the investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through the Internet. GAO's Web site (www.gao.gov) contains abstracts and full-text files of current reports and testimony and an expanding archive of older products. The Web site features a search engine to help you locate documents using key words and phrases. You can print these documents in their entirety, including charts and other graphics.

Each day, GAO issues a list of newly released reports, testimony, and correspondence. GAO posts this list, known as "Today's Reports," on its Web site daily. The list contains links to the full-text document files. To have GAO e-mail this list to you every afternoon, go to www.gao.gov and select "Subscribe to daily E-mail alert for newly released products" under the GAO Reports heading.

Order by Mail or Phone

The first copy of each printed report is free. Additional copies are $2 each. A check or money order should be made out to the Superintendent of Documents. GAO also accepts VISA and Mastercard. Orders for 100 or more copies mailed to a single address are discounted 25 percent. Orders should be sent to:

U.S. General Accounting Office
441 G Street NW, Room LM
Washington, D.C. 20548

To order by Phone:
Voice: (202) 512-6000
TDD: (202) 512-2537
Fax: (202) 512-6061

To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Web site: www.gao.gov/fraudnet/fraudnet.htm
E-mail: fraudnet@gao.gov
Automated answering system: (800) 424-5454 or (202) 512-7470

Public Affairs

Jeff Nelligan, managing director, NelliganJ@gao.gov (202) 512-4800
U.S. General Accounting Office, 441 G Street NW, Room 7149
Washington, D.C. 20548