SAFETY PERFORMANCE DATA

RSPA's Office of Hazardous Materials Safety (OHM) maintains the Hazardous Materials Information System (HMIS). This system is the principal source of safety data related to hazardous materials transportation. It contains comprehensive information on hazardous materials incidents, exemptions and approvals, enforcement actions, and other elements that support the regulatory program.

The HMIS is used by DOT, other Federal agencies, state and local governments, industry, researchers, the media, and the public. HMIS data supports regulatory evaluation and policy making, training programs, the better understanding of hazardous materials transportation incidents, and identification of possible safety problems.

The HMIS migration from its existing database management system into a more robust environment continued in 2000. RSPA expects this migration to improve system performance, maintenance, and accessibility. Alternative methods of archiving incident source documents are ongoing to improve the HMIS storage capability and the ease of retrieving reports. RSPA continues to make more data and reports available to the public on the Office of Hazardous Materials Safety Internet Home Page.

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PLEASE NOTE:
The following analysis is based on HMIS Incident Reports received by DOT through September 14, 2001, and is not based on the most current incident information. Each month DOT continues to receive and process Incident Reports for the current and previous years.

To see the most up-to-date Incident information, please see the "Hazardous Materials Incident Summary Statistics and Data" reached from the SPILLS section of the Office of Hazardous Materials Safety web site:

http://hazmat.dot.gov/spills.htm

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2000 Safety Statistics (Data as of September 14, 2001)

In 2000, 17,431 hazardous materials incidents were reported. The total number of incidents decreased by 198 this year. This is an decrease of 1.1 percent. Highway, rail, and air incidents all decreased this year. Highway incidents decreased by 27 to 14,943, remaining at about 86 percent of total incidents. Rail incidents decreased by 18 to 1053. Air incidents remained a small percentage of the total incidents, decreasing just one percent to 8.1 percent of total incidents. When compared to the other modes, air incidents showed the most change, decreasing by 10.1 percent (160 incidents) to 1,420. However, this is the smallest percent change in air incidents from one year to the next over the last eight years. Along with this trend, air incident injuries have continued their downward trend from a high of 57 in 1994 to 5 in 2000. This reflects continued efforts by both RSPA and FAA to improve hazardous materials transportation safety. Although there were few non-bulk water incidents in 2000, these 15 non-bulk water incidents are the highest number reported in the last eight years. Examining the incidents by hazard class, corrosive materials and flammable-combustible liquids were involved in the most incidents, accounting for about 80 percent of all 2000 incidents.

Serious incidents, which RSPA has defined as an incident that involves a fatality or major injury due to a hazardous material, closure of a major transportation artery or facility or evacuation of six or more persons due to the presence of a hazardous material, or a vehicle accident or derailment resulting in the release of a hazardous material, changed very little with a 1.1 percent increase from 1999 to 2000. The 457 serious incidents equal 2.6 percent of all 2000 incidents. Further, in 2000, bulk incidents, while only 18.1 percent of all incidents, accounted for 81.4 percent of all serious incidents.

Eleven incidents in 2000 resulted in fatalities:

- Five were the result of a vehicle crash that caused the loads to ignite (four loads were gasoline and the other was fuel oil).
- One fatality incident was the result of a vehicle crash that released anhydrous ammonia vapor.
- Five were caused by problems that occurred while unloading the material. One of these unloading incidents also caused a fire that burned down a public school (after school hours).

Five rail incidents and one highway incident involved the evacuation of a thousand or more people:

- Five rail cars released 86,000 gallons of a flammable liquid, n.o.s. in Scottsbluff, NE. Local authorities evacuated approximately 3,200 people in the surrounding 25 square blocks for about two days.
- As a result of a multi-car derailment in Eunice, LA, various hazardous materials were released from seven rail cars and 2,500 people were evacuated.
- A release of hydrochloric acid vapor, due to the failure of a rail car's rubber liner, resulted in the evacuation of approximately 2,400 people in Sterling Heights, MI, for about twelve hours.
- An eleven block area of New Iberia, LA, was evacuated for about 24 hours after a train derailment resulted in a release of 600 gallons of xylenes.
- A highway shipment of nitric acid in an unlabeled 55 gallon drum was accidently unloaded into a container of hypochlorite solution at the Humbolt High School in St. Paul, MN, causing a

chemical reaction resulting in a vapor release. 1,500 people at the school were evacuated while the site was neutralized.

- The crew of a passing train observed smoke coming from a boxcar under seal in Danville, KY. The boxcar containing sodium dithionite was isolated in the yard by evacuating 1,000 people in the surrounding community for about three hours. The car was then moved to a more isolated area for emergency handling and five residences in that area were evacuated for four days.

There were five train derailments in 2000 that resulted in damages greater than $1 million. These five derailments accounted for 77.4 percent of all damages due to rail and 32.2 percent of all reported damages. The incidents described above maintain the urgency of DOT's continuous work to improve safety in transporting hazardous materials.

Description of Charts and Graphs (Data as of September 14, 2001)

Exhibits 1.1 and 1.2 summarize hazardous materials transportation incidents over the past eight years. The number of incidents increased significantly in 1994 and dropped through 1995 and 1996. Since then, the number of incidents has gradually increased to over 17,000 in both 1999 and 2000. Highway, clearly the most prevalent mode for incidents, accounted for the majority of incidents (86 percent) in the period from 1993 to 2000 and for all fatalities except in 1996, when an air incident and two rail incidents resulted in fatalities, and in 2000, when one rail incident resulted in a fatality. Serious incidents have remained relatively steady throughout the 1990s, with the average number of serious incidents per year being just under 450.

Exhibit 1.3 summarizes vehicular accident and derailment incidents over the past eight years. The average number of incidents per year has been just over 300. All fatalities from these incidents were highway-related, except for two rail fatalities that occurred in 1996. All injuries occurred in the highway and rail modes of transport.

Exhibit 1.4 summarizes hazardous waste incidents over the past eight years. The total number of hazardous waste incidents in 2000 is 48.7 percent lower than the 1995 peak value. The only hazardous waste incident that resulted in a fatality occurred in 1996. Most injuries involved highway and rail modes of transport. The only injuries involving the air mode of transportation occurred in 1998.

Exhibits 2.1 and 2.2 display hazardous materials transportation incidents and fatalities over the past eight years and correspond to data from Exhibit 1.1.

Exhibits 2.3 - 2.6 display the number of incidents by mode over the past eight years. Exhibit 2.5 shows the noticeable increase in reporting of air incidents in 1998 and 1999 and a slight drop in 2000. The number of incidents that are bulk and non-bulk is also shown for highway and rail. The number of bulk incidents has remained fairly steady since 1990, except for a noticeable reduction in bulk rail incidents in 1998.

Exhibit 3.1 displays the hazardous materials incidents reported since 1986 and regulatory changes affecting reporting requirements. The graph is segmented into highway and all other incidents, and shows the impact highway incidents have on the trend of incidents. The increases in incident reporting in 1994 and in 1999 and 2000 are also particularly evident.

Exhibit 3.2 displays the serious hazardous materials incidents since 1990. Note that serious incidents are measured on a different scale than all incidents. Serious incidents have remained relatively steady throughout the 1990s.

Exhibit 3.3 illustrates the number of all incidents since 1990 that involved commodities shipped in bulk packagings. The number of bulk incidents has remained fairly constant during this period; most of the variability in the number of incident reports is due to changes in the number of non-bulk incidents.

Exhibits 4.1.1 and 4.1.3 show reported incidents and damages by hazard class. The first four columns of Exhibit 4.1.1 present and rank incidents by hazard class, and the last four columns present the number of incidents involving dollar damages, damages by dollar amount, percent, and rank. The majority of incidents and damages involved corrosive materials and flammable-combustible liquids. Exhibit 4.1.3 graphically depicts the distribution of incidents among the top five hazard classes.

Exhibit 4.2.1 displays injuries by hazard class. Also included is a breakdown between major and minor injuries. In 2000, corrosive materials, spontaneously combustible materials, flammable-combustible liquids, and poisonous materials accounted for more than 72 percent of injuries.

Exhibit 4.3 lists the hazardous materials involved in incidents resulting in fatalities. One air incident in 1996 involving oxidizers resulted in 110 fatalities. Of the remaining materials, gasoline accounted for the most fatalities each year.

Exhibit 4.4.1 ranks the 50 top hazardous materials involved in incidents. These 50 materials, out of approximately 3,000 hazardous materials identified in the Hazardous Materials Table, 49 CFR §172.101, were involved in 74.9 percent of all incidents in 2000. The Exhibit lists the commodity, corresponding hazard class, number of incidents reported for that commodity, and corresponding percentage.

Exhibit 4.5.1 ranks the hazardous materials involved in serious incidents. These materials were involved in less than three percent of all incidents in 2000. Gasoline accounts for more serious incidents than any other hazardous material. The Exhibit lists the commodity, corresponding hazard class, number of incidents reported for that commodity, and corresponding percentage.

Exhibit 5 shows the distribution of incident damages in the five categories that appear on the report form. Carrier damage and decontamination/cleanup costs made up 83.3 percent of the costs associated with incidents involving damages in 2000.

Exhibit 6.1 shows the breakdown of incident causes by mode of transportation. Human error was the main cause of incidents in 2000. Combined with package failure, these two causes are responsible for over 97 percent of all incidents. Note that for accidents and derailments the cause of the crash is not determined.

Exhibit 7.1 displays information on incidents involving an evacuation. The incidents are broken down by mode, cause, and consequence. Human error was the main cause of evacuation incidents in 2000. While highway had the highest number of incidents with evacuations, rail incidents caused the greatest number of people to be evacuated.

Exhibit 8.1.1 shows the consequences of hazardous materials incidents by transportation phase. As can be expected, most incidents resulting in high damages were due to en route accidents. En route accidents also resulted in the highest number of fatalities. Unloading incidents result in the second largest number of fatalities, the most minor injuries, and by far the largest number of incidents.

Exhibit 8.2.1 displays the consequences of bulk and non-bulk hazardous materials incidents. Although an approximately equal number of minor injury incidents result from bulk and non-bulk incidents, bulk incidents lead to significantly more incidents with major injuries and damages greater than $50,000, and accounted for all the incidents with fatalities. Non-bulk incidents accounted for the majority of evacuation incidents.

Exhibit 8.3.1 illustrates the consequences of hazardous materials incidents by time of day. Most injuries occur between 9 a.m. and noon. Fatalities are distributed from 9 a.m. to midnight.

Exhibit 9.1 shows the number of serious bulk and non-bulk hazardous materials incidents by time of day. Most serious incidents occurred between 6 a.m. and 3 p.m.

Exhibit 10.1 displays the breakdown of hazardous materials incidents, fatalities, injuries, and damages by state. States with large population centers and industrial cities had the most hazardous materials incidents.

Exhibits 11.1.1 - 11.7.1 display 2000 incident data by county. The areas with the greatest concentration of hazardous materials incidents either were industrial centers or included numerous terminal facilities. Exhibit 11.1.1 displays the location of all incidents reported to RSPA. Exhibit 11.2.1 shows the origin of shipments that resulted in an incident. Exhibit 11.3.1 shows the location of highway incidents and Exhibit 11.4.1 displays the location of rail incidents. Exhibit 11.5.1 shows the location of loading and unloading incidents and Exhibit 11.6.1 shows the location of incidents that occurred en route. Exhibit 11.7.1 shows the location of serious incidents. Note that the exhibits for rail, en route, and serious incidents use a different classification scheme from the other exhibits.