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Report to the Chairman, Committee on Energy and Commerce, House of Representatives

November 1989

# RAILROAD SAFETY

# DOT Should Better Manage Its Hazardous Materials Inspection Program




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**United States**
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**Resources, Community, and**
**Economic Development Division**

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November 17, 1989

The Honorable John D. Dingell
Chairman, Committee on Energy
and Commerce
House of Representatives

Dear Mr. Chairman:

In response to your request, this report addresses the adequacy of the Federal Railroad Administration's hazardous materials inspection program, and the progress made by the Research and Special Programs Administration to (1) improve the accuracy and completeness of its Hazardous Materials Information System and (2) register shippers of hazardous materials.

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time, we will send copies to interested congressional committees; the Secretary of Transportation; the Administrator of the Federal Railroad Administration; the Administrator of the Research and Special Programs Administration; and the Director, Office of Management and Budget. We will also make copies available to others upon request.

This work was done under the direction of Kenneth M. Mead, Director, Transportation Issues (202) 275-1000. Other major contributors are listed in appendix II.

Sincerely yours,

J. Dexter Peach
Assistant Comptroller General

# Executive Summary

## Purpose

In 1988, over 1.1 million carloads of poisons, chemicals, pesticides, and other hazardous materials were moved by rail in about 100,000 tank cars and in other types of containers. Concerned about railroad safety, the Chairman, House Committee on Energy and Commerce, asked GAO to determine whether federal safety programs were adequate to protect the public from being injured in train accidents. This report, the second in a series, (1) evaluates the effectiveness of the Federal Railroad Administration's (FRA) hazardous materials inspection program and (2) discusses the extent to which the Research and Special Programs Administration (RSPA) has improved its hazardous materials information system and established a program to register hazardous materials shippers.

## Background

Within the Department of Transportation, RSPA is responsible for issuing regulations governing the transportation of hazardous materials by air, highway, pipeline, rail, and water. FRA is responsible for enforcing RSPA's rail regulations through its hazardous materials inspection program. FRA's responsibility is to ensure that shippers and railroads comply with RSPA's regulations while transporting hazardous materials by rail. FRA inspectors cited shippers and railroads 499 times for violating regulations in 1984 and 3,575 times in 1988, a 600-percent increase. Shippers are responsible for loading hazardous materials into rail cars and transferring them to railroads for shipment.

RSPA collects information on hazardous materials releases, accidents, and enforcement actions from shippers and carriers (e.g., railroads) and stores this information in its hazardous materials information system. FRA needs information on releases for planning and implementing its inspection program, and uses information in RSPA's system as well as information from its own hazardous materials reporting system.

## Results in Brief

FRA's hazardous materials inspection program has not been effectively implemented. Because of this, FRA cannot ensure that shippers and railroads are adhering to RSPA's hazardous materials regulations. FRA has experienced implementation problems because

- of inadequate headquarters guidance on procedures for inspecting shippers and railroads, including how shippers and railroads should be selected for inspection and what authority inspectors have to cite shippers for noncompliance with safety regulations;

- it did not use a systematic approach to target high-risk shippers and railroads for inspections;
- inspectors were concentrating on inspecting individual tank cars rather than evaluating the effectiveness of shippers' and railroads' safety procedures; and
- it did not have a sufficient number of inspectors to ensure that shippers and railroads were complying with hazardous materials regulations.

Past GAO and Office of Technology Assessment studies criticized RSPA for not maintaining an accurate and complete hazardous materials information system. RSPA has made some improvements, but more needs to be done.

# Principal Findings

## Inadequate Headquarters Guidance

FRA's hazardous materials manual used by regional inspectors, which was published in 1983, is outdated. It contains general guidance and goals that have been superseded or contradicted by FRA officials. For example, the manual states that 55 percent of an inspector's time should be spent inspecting shippers. FRA headquarters' officials verbally changed this criterion to 80 percent in 1988, but few field inspectors GAO interviewed understood this change.

Further, the manual does not describe ways for inspectors to identify and target high-risk shippers and is not clear about when shippers and railroads should be cited for noncompliance, or how and when to update lists of shippers. The manual also does not clearly state inspectors' authority to issue violations at shippers' facilities, and several inspectors were unsure about their ability to cite shippers.

## High-Risk Shippers Not Targeted for Inspection

In its 1987 report on enhancing Department of Transportation policy and program effectiveness, GAO discussed ways to strengthen management of safety programs and resources. GAO emphasized the importance of targeting inspection resources at high-risk conditions. Although information is available in RSPA's hazardous materials information system and in its own reporting system, FRA has not used the information to target high-risk shippers and railroads. Rather, FRA relies on the judgment of inspectors to select shippers and railroads for inspection.

## Inspections Not Focused on Safety Procedures

FRA's hazardous materials manual instructs inspectors to monitor the overall adequacy of shipper safety and inspection procedures. However, inspectors generally concentrate more on inspecting individual cars carrying hazardous materials rather than reviewing the adequacy of safety procedures at both shipper and railroad facilities. With about 1.1 million rail car movements in 1988 and increasing annually, inspectors can only inspect a small fraction of these cars. Therefore, the emphasis on inspecting individual cars rather than reviewing safety procedures has reduced the efficiency and effectiveness of the inspection program.

## Insufficient Staff Resources

FRA does not have enough staff to accomplish its objective of ensuring that shippers and railroads are complying with RSPA's regulations. In May 1989, FRA employed a nationwide staff of 28 inspectors to inspect an estimated 85 railroads, 15,000 shippers, and 100,000 tank cars. In the four regions GAO reviewed, a regional goal stipulated that inspectors annually visit all shipper and railroad facilities. FRA inspectors actually visited 699 facilities out of a universe of 2,312, or about 30 percent in those regions. Also, during the period 1984-88, FRA inspected about 67,000 hazardous materials cars each year.

Because of budget restrictions, FRA was not actively seeking applicants to fill six vacant positions or to add additional positions. States currently cannot assist FRA as they do in other rail safety inspection areas. Twenty-one states have adopted federal hazardous materials regulations, and 12 states have hazardous materials inspection programs. Officials in four states said that they would be interested in assisting FRA. However, FRA has not sought statutory authority to certify state inspectors to participate in its hazardous materials program.

## Hazardous Materials Information Not Complete

RSPA's hazardous materials information system should contain detailed information on all transportation-related releases of hazardous materials, including those caused by railroad accidents and incidents. RSPA's regulations require carriers to report this information. GAO found that in 1987 and 1988, 96 hazardous materials rail accidents were reported to FRA but 23 of those were not in RSPA's data base.

While RSPA has implemented some of GAO's and the Office of Technology Assessment's past recommendations, it has not taken action on others including (1) requiring shippers to submit reports of hazardous materials releases, (2) requiring updated information on incidents after investigations have taken place, and (3) sharing accident and enforcement data

with other agencies to identify non- and misreporters. RSPA has also not required major hazardous materials shippers to register, as recommended by GAO. A RSPA official said that such information is already available, but RSPA has elected not to use the data because it is proprietary. It therefore still has no accurate knowledge of the population it regulates.

## Recommendations

GAO recommends that the Secretary of Transportation direct the FRA Administrator to take a number of actions, including updating FRA's hazardous materials manual, clarifying inspectors' authority to write violations at shipper facilities, and establishing a new inspection approach that includes (1) identifying high-risk shippers and railroads, and targeting them for inspection and (2) emphasizing inspections of safety procedures and secondarily inspecting tank cars. Further, the Administrator should initiate studies to determine (1) staffing needed to implement the hazardous materials inspection program and (2) states' interest in having their inspectors augment FRA hazardous materials inspectors. If sufficient state interest exists, legislative changes to authorize state inspectors to perform FRA hazardous materials inspections should be requested.

GAO recommends that the Secretary direct the RSPA Administrator to establish a procedure to (1) routinely compare data in its information system with similar data in other systems and (2) follow through on GAO's 1980 recommendation to establish a mandatory registration program for hazardous materials shippers.

## Agency Comments

GAO discussed its findings with agency officials and incorporated their comments where appropriate. However, as requested, GAO did not obtain official agency comments on this report.

# Contents

## Abbreviations

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| AAR | Association of American Railroads |
| DOT | Department of Transportation |
| EPA | Environmental Protection Agency |
| FRA | Federal Railroad Administration |
| GAO | General Accounting Office |
| HMIS | Hazardous Materials Information System |
| NTSB | National Transportation Safety Board |
| OTA | Office of Technology Assessment |
| RSPA | Research and Special Projects Administration |

# Introduction

In a letter to the Comptroller General, the Chairman, House Committee on Energy and Commerce, stated his concern about railroad safety and requested that we determine whether the Department of Transportation's (DOT) safety activities were adequate to protect the public from being injured in train accidents. This is the second of a series of reports responding to the Chairman's request.[1] It assesses the adequacy of the Federal Railroad Administration's (FRA) hazardous materials safety inspection program, and the progress made by the Research and Special Programs Administration (RSPA) to implement past GAO and Office of Technology Assessment (OTA) recommendations. These recommendations were made to improve RSPA's hazardous materials information system (HMIS) and establish a hazardous materials shipper registration program.

## Rail Transportation of Hazardous Materials in the United States

According to a 1989 report issued by the Association of American Railroads (AAR), an estimated 1.1 million carloads of hazardous materials moved by rail in 1988. This volume has increased steadily since 1985. These hazardous materials range from extremely hazardous class A explosives and poisons to nonflammable gasses. Over 30,000 types of hazardous materials are regulated by DOT; however, 25 commodities make up 73 percent of the total volume shipped by rail. (See app.I.)

While neither FRA nor AAR have exact figures regarding the number of tank cars and other types of vessels that carry hazardous materials in the United States, they provided the following estimates. About 100,000 tank cars and about 40,000 intermodal tanks (see below) annually carry various types of hazardous materials. Tank car movements make up about 75 percent, or about 825,000 carloads, of the annual volume. A tank car carries the largest volume of materials, up to 34,500 gallons, and may only be transported by rail. Intermodal tanks are smaller, carrying about 6,000 gallons, and can be transported by rail, ship, and truck trailer.

## Major Defects Increasing

Statistics from FRA's inspection data base indicate that the number of serious hazardous materials problems is increasing. In 1984, inspectors identified 10,599 defects in their inspection reports. In 1988, they identified 17,886 defects—an increase of 69 percent. Violations rose more dramatically over the 5-year period, from 499 in 1984 to 3,575 in

[1]Our first report was entitled Railroad Safety: FRA Needs to Correct Deficiencies in Reporting Injuries and Accidents (GAO/RCED-89-109, Apr. 5, 1989).

1988—a 600-percent increase. These increases were not the result of additional inspections. While the numbers of hazardous materials inspections increased from 8,684 in 1984 to 9,061 in 1986, they then dropped to 7,878 in 1988. Throughout the 5-year period, the ratio of shipper inspections to railroad inspections remained fairly constant, with shipper inspections accounting for 28 to 33 percent of the total inspections performed.

FRA's hazardous materials inspection program is designed to reduce the risks associated with potentially catastrophic accidents or inadvertant hazardous materials releases. In 1982, FRA's Associate Administrator for Safety stated that the highest priority is given to reducing this risk. In 1986, OTA stated that although people are aware that hazardous materials can wreak enormous health and environmental damage, they take for granted both transportation and the amenities of modern life brought to them by the petroleum, nuclear, and chemical industries. Consequently, while relatively infrequent, spectacular accidents underscore the harm that can be done and, in our opinion, the importance of an effective inspection program.

## Federal Role in Hazardous Materials Regulation

The federal government's role in railroad safety is to protect the public by ensuring the safe operation of passenger and freight trains. The Secretary of Transportation's responsibilities, under the Federal Railroad Safety Act of 1970,[2] as amended, and the Hazardous Materials Transportation Act,[3] as amended, have been delegated to RSPA and FRA. RSPA is responsible for issuing regulations governing the transportation of hazardous materials for the administrations within DOT that are responsible for regulating transportation by highway, rail, air, water, and pipeline. FRA enforces the regulations as they apply to rail transportation through its hazardous materials safety program. This program is designed to promote the safe transportation of explosives, flammables, poisons, and other hazardous materials by ensuring that shippers (shippers, freight forwarders, and consignees)[4] and railroads comply with federal hazardous materials laws, rules, and regulations.

[2]Pub. L. No. 91-458, 84 Stat. 971 (1970).

[3]Pub. L. No. 93-633, 88 Stat. 2156 (1975).

[4]Shippers, freight forwarders, and consignees are all involved in transportation of hazardous materials. In this report, the term "shippers" will be used to refer to all three.

## Hazardous Materials Regulations

The Hazardous Materials Transportation Act eliminated earlier statutory authority under which each transportation administration[5] issued its own safety regulations, including those regarding hazardous materials. The regulations generally require that no person may offer or accept hazardous materials for transportation in commerce unless those materials are properly classed, described, packaged, marked, labeled, and in condition for shipment as required or authorized by hazardous materials regulations. Shippers and railroads are also required to establish employee hazardous materials training programs.[6]

Three years after the act was passed, DOT created RSPA and authorized it to issue hazardous materials regulations for the transportation agencies and to enforce its regulations at seaports and hazardous materials container manufacturers. FRA and the other DOT administrations retained the authority to inspect the shipment of materials and to enforce regulations.

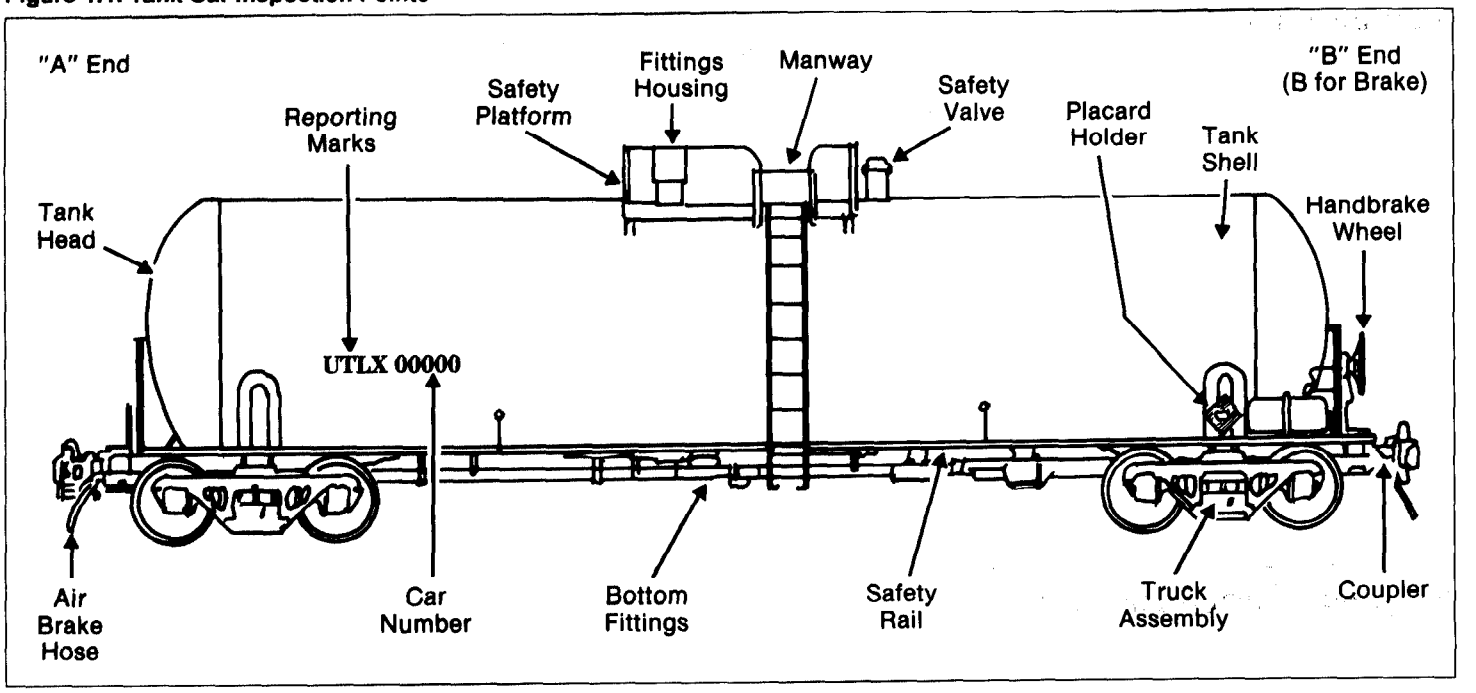
## Shippers' Responsibilities

Shippers are responsible for ensuring that all rail tank cars and other cars carrying hazardous materials comply with RSPA regulations. For tank cars, the shippers must ensure, to the extent practicable, that (1) the tank, safety appurtenances, and fittings are in proper condition for the safe transportation of hazardous materials; (2) interior heater coils are loaded with inlet and outlet caps off during the entire time the tanks are being loaded and show no sign of leakage with caps off, and (3) all openings and their protective housing are properly closed. (Fig. 1.1 illustrates typical tank car inspection points.) Prior to shipping hazardous materials by rail, shippers are required to certify on shipping papers that the materials are properly classed, described, packaged, marked and labeled, and in proper condition for transportation according to RSPA's regulations.

[5]The DOT administrations involved in hazardous materials transportation are FRA, the Federal Highway Administration, RSPA, the Federal Aviation Administration, and the U.S. Coast Guard.

[6]49 C.F.R. Section 171.2.

**Figure 1.1: Tank Car Inspection Points**




Source: Association of American Railroads.

## Railroads' Responsibilities

Upon receiving a loaded hazardous materials rail car from a shipper, railroads are responsible for inspecting it to ensure that it is in proper condition for transportation. This includes inspecting the car to make sure that it is not leaking and that the air and hand brakes, journal boxes (axle housings), and trucks (wheel assemblies) are in proper condition for service. Railroads are required to inspect empty hazardous materials tank cars upon receipt to make sure that (1) all manhole covers, outlet valve reducers, outlet valve caps, outlet valve cap plugs, end plugs, and plugs or caps or other openings are properly secured and in their proper places and (2) heater coil inlet and outlet pipes are open for drainage. Railroads must have on file a copy of the shipper's certified shipping paper for each shipment of hazardous materials it handles.

## FRA Hazardous Materials Inspection Procedures

The primary objective of FRA's hazardous materials safety program is to minimize the risk of a catastrophic release of dangerous chemicals stemming from accidents or incidents involving a rail car carrying hazardous materials. To achieve this objective, FRA has established a nationwide inspection program designed to promote the safe rail transportation of

explosives, flammables, poisons, and other hazardous materials by ensuring that railroads, shippers, freight forwarders, consignees, and container manufacturers adhere to DOT's hazardous materials regulations. Directed by FRA's Office of Safety, FRA has a field force of 28 hazardous materials inspectors (as of May 1989) who annually inspect an estimated 85 railroads, 15,000 shippers, and 100,000 hazardous materials tank cars. Inspectors are assigned to each of FRA's eight regional offices and are responsible for inspecting the railroads, shippers, and tank cars within a specific territory. Supervisory Railroad Safety Inspectors and regional Hazardous Materials Specialists oversee the inspection activities and provide inspectors with technical support and training to promote uniform understanding and application of hazardous materials safety laws, regulations, and orders.

Both FRA headquarters and regional offices provide guidance on how and how often inspections should be carried out. Headquarters guidance is contained in both the Hazardous Materials Enforcement Manual and in verbal instructions given by headquarters officials. Regional guidance appears primarily in the National Inspection Plan, a document composed of eight regional plans for all types of rail safety inspections.[7]

## Enforcement Manual Requirements

Hazardous materials inspections are to be conducted in accordance with FRA's Hazardous Materials Enforcement Manual. According to the manual, inspectors are responsible for the impartial and uniform application of the laws, rules, regulations, and orders which pertain to railroad practices. The inspector is concerned with all aspects of the transportation of hazardous materials by rail, including the administration and enforcement of safety regulations by shippers and railroads. The inspector has a list of known inspection points (facilities that handle hazardous materials) to determine where to conduct inspections.

Among other things, the inspector is to determine whether the shippers are inspecting, loading, unloading, and placarding tank cars in conformance with the applicable regulations. The inspector should also determine if the shipper has a training program regarding the hazardous materials regulations for its employees. At rail facilities, the inspector should determine the railroad's compliance with the regulations by reviewing railroad records related to hazardous materials shipments and evaluating the accuracy and efficiency of hazardous materials training

[7]The National Inspection Plan does not include any agencywide guidance. It is simply a document which collates the eight regional inspection plans.

being given to railroad employees. The inspector generally inspects tank cars at rail facilities, which provides information on the safety procedures followed by both railroads and shippers. He may also make equipment and operations inspections to determine whether rail cars are in compliance with safety regulations and that the cars are properly sequenced in the train.

After inspecting a facility, the inspector prepares a Hazardous Materials Inspection Report, containing such information as the name and address of the facility, inspection date, and a description of any defects or potential violations noted during the inspection. The inspector makes his own decision as to whether a safety problem will be written in the report as a defect or violation,[8] or whether it will be resolved verbally with facility officials. The inspection report usually does not document areas found to be in compliance in the inspection. The report must be completed within 10 days with copies sent to the company that was inspected and to the appropriate FRA regional office.

In addition to the inspection duties described above, the inspectors investigate railroad accidents and complaints, prepare violation reports, provide hazardous materials safety training classes to both shippers and railroads when requested, participate in other types of inspections requested by FRA headquarters, and perform various other administrative duties. These noninspection duties, required by both headquarters and regional management, take up about 34 percent of the inspectors' work time.

## Hazardous Materials Data Bases

FRA needs information about hazardous materials incidents (any unintentional release of a hazardous material) as well as rail accidents to, among other things, establish its inspection strategy and the number of inspectors it needs. To obtain this information, it relies on both its own automated accident/incident data base and the HMIS operated by RSPA. FRA's data base was established to keep track of all railroad accidents that involved releases of hazardous materials.

The HMIS data base was established to collect information from shippers and all types of carriers, including railroads, about hazardous materials incidents during transportation, and during temporary storage related to

[8]Defects and violations are essentially the same instances of regulatory noncompliance, except that violations are considered more severe based on the type of material involved and the previous record for safety compliance. A violation is forwarded to FRA General Counsel for processing to assess civil penalties.

transportation. HMIS includes a subsystem that focuses on releases of all hazardous substances both at fixed site facilities and during transportation. The primary function of the HMIS is to serve as an information resource to monitor DOT's hazardous materials transportation programs. In support of these activities, HMIS can provide information on incidents, enforcement actions, inspection activities, regulations, approvals, exemptions, and certificates.

## Objectives, Scope, and Methodology

We conducted this review at the request of the Chairman, House Committee on Energy and Commerce. Our objectives were to (1) evaluate the adequacy of FRA's hazardous materials inspection program[9] and (2) determine the progress RSPA has made in implementing past GAO and OTA recommendations to improve the HMIS and to establish a hazardous materials shipper registration program.

We conducted our review at RSPA and FRA headquarters offices, and at four of eight FRA regional offices (Chicago, Ill.; Fort Worth, Tex.; Philadelphia, Pa.; and San Francisco, Calif.). These four regions were selected because they accounted for about two-thirds of the total hazardous materials rail originations nationwide in 1988, and because the regions were dispersed across the country. We also interviewed officials in four state railroad inspection programs—California, Illinois, Pennsylvania, and Texas—to obtain their views on FRA's hazardous materials inspection program and what role they might play in assisting FRA.

To determine the legal authority and responsibility for hazardous materials rail safety, we examined laws, regulations, delegations of authority, operating manuals, and other pertinent documents. To assess the adequacy of FRA's hazardous materials inspection program, we interviewed and obtained documents from FRA's hazardous materials inspectors, specialists, and supervisors in the four regions. We reviewed pertinent FRA operating manuals and other instructions providing guidance to FRA hazardous materials safety inspectors. We also reviewed information received by the four FRA regional offices from the FRA and RSPA data bases, and analyzed how the regions used the information in carrying out their programs.

To determine the amount of coverage and types of inspections performed, we analyzed inspection point lists, inspection reports, and

[9]In evaluating the adequacy of the FRA program, we relied on internal control standards for federal agencies as defined in our publication Standards for Internal Controls in the Federal Government.

monthly activity reports prepared by inspectors from the four regions. We interviewed 12 of the 28 FRA hazardous materials inspectors who were on board as of May 1989, and observed some of them as they conducted tank car and facilities inspections. We also reviewed training histories of the 30 inspectors employed by FRA during 1988 and discussed inspector training with responsible FRA headquarters officials.

As part of our analysis of FRA inspections of railroads and shippers, we obtained information from FRA's hazardous materials inspection data base for calendar years 1984 through 1988. This included statistics on the numbers of inspections performed, and the types of defects and violations cited in the inspection reports.

To assess the progress RSPA has made in improving the HMIS, we interviewed appropriate officials in RSPA headquarters and reviewed pertinent supporting documents. To assess the status of RSPA's actions to establish a shipper registration program, we reviewed a draft report prepared by RSPA staff on the subject and discussed the results with the cognizant RSPA officials. We compared the information in FRA's data base with that in RSPA's to determine whether RSPA's data base was accurate and complete.

We discussed our findings with FRA and RSPA program officials and have included their comments where appropriate. However, as requested, we did not obtain official comments on this report. Our work was performed from July 1988 through August 1989 in accordance with generally accepted government auditing standards.

# FRA Inspection Program Not Effectively Implemented

FRA's inspectors, hampered by inadequate guidance, are not effectively implementing the hazardous materials inspection program. The inspectors do not use a systematic approach that targets high-risk shippers and railroads to plan and carry out their inspections. They also do not routinely evaluate shippers' safety procedures, which could provide greater assurance that hazardous materials are being handled and transported safely. Instead, inspectors concentrate on inspecting rail facilities and tank cars in shipment, even though hazardous materials releases are more likely to occur at shipper facilities during loading and unloading. Finally, FRA does not currently have enough inspectors to achieve the program's goals effectively and is not actively seeking to either fill vacant inspector positions or obtain the authority to certify state inspectors to perform hazardous materials inspections.

## Inspection Guidance Inadequate

The Hazardous Materials Enforcement Manual, FRA's agencywide written guidance for hazardous materials inspectors, is out of date, contradicted by regional goals and guidance, and silent or vague with regard to important parts of the inspection process and inspectors' authority. These shortcomings limit inspectors' ability to effectively carry out program responsibilities.

The Enforcement Manual, issued in 1983,[1] describes certain goals for inspectors in reviewing shippers and railroads. Among other things, the manual calls for (1) inspecting all railroad facilities handling hazardous materials once a year; (2) monitoring, to the extent possible, each rail shipper of hazardous materials for compliance with the federal regulations; and (3) allocating 55 percent of inspectors' time to inspecting shipper facilities, 40 percent to railroad handling and billing facilities, and 5 percent to container manufacturers. The goal of inspecting all railroads annually is the only goal that appears to be consistently understood by most of the FRA officials we spoke to.

## Vague, Conflicting Guidance

The manual is not clear on how often shippers or container manufacturers should be inspected and provides no criteria for monitoring or inspecting container manufacturers. The headquarters Hazardous Materials Specialist said that there is no requirement for frequency of shipper inspections, but that most major shippers were to be inspected

[1] A revised version is being written, but officials could not estimate when a new manual would be issued. We were told that the headquarters hazardous materials staff was busy with more pressing matters.

annually ("major" is defined as shippers who transport more than one hazardous materials tank car per day). He also said that every hazardous materials shipper should be inspected at least every 5 years. Regional FRA officials, on the other hand, have interpreted this goal to mean that all inspection points,[2] including shippers, should be inspected once each year. Eight of the 12 hazardous materials inspectors we spoke to said that any type of numerical goal was unrealistic, given the unpredictable nature of their jobs and the unique characteristics of each inspector's territory.

The manual's guidance on inspection time allocation among shippers, container manufacturers, and railroads was verbally superseded in 1988. According to the headquarters Hazardous Materials Specialist, inspectors now should allocate 80 percent of their inspection time to shippers and container manufacturers, and 20 percent to railroads. He said this change was made to more heavily monitor shippers. He further said that if the regulations were being complied with at the point of origin, the likelihood of hazardous materials releases during shipment would greatly diminish.

FRA field officials, however, had varying understandings of the inspection time allocation goal, citing goals of 40, 55, 60, 70, 80, 85, or 90 percent of their time to being spent on inspecting shippers' facilities. Nine of the 12 supervisors and specialists could not correctly identify the 80 percent goal. Other supervisors and specialists said they were aware that percentage goals had been established, but did not know what the goals were. Eight of the 12 inspectors we interviewed said the goal was something other than 80 percent.

## Inspection Processes, Authority Not Defined

Each hazardous materials inspector maintains an inspection point list from which he selects and schedules his inspections. Inspectors will occasionally recognize new hazardous material shippers in their territories, and conduct an inspection if they feel it is prudent. The Enforcement Manual does not define how often inspection point lists should be updated. A district supervisor in one region stated that there is no requirement to update them periodically. However, officials in the other three regions said the lists should be updated annually. Headquarters officials said that inspection lists should be updated each time an inspector visits a railroad facility and reviews hazardous materials shipping

[2]An inspection point is a shipper or carrier facility that is inspected and results in an inspection report.

documents. We found that none of the inspection point lists for the 11 territories we reviewed were updated routinely.

The method by which shippers and railroads are selected for inspection is also not defined in the Enforcement Manual, which states only that inspectors should give particular attention to shippers that load or unload tank cars, or that handle class A or B explosives. We found that inspection point selection is only marginally addressed in the regional inspection plans. Six of the eight plans for 1988 were silent on the issue of selecting inspection points. The Region 2 plan stated that its inspectors should develop priorities for each territory and focus on the shipper and railroad facilities with the highest number of incidents. The Region 3 plan emphasized inspections of shippers and railroads with the largest volume of hazardous materials and of railroads (not shippers) that have experienced accidents or incidents. However, this plan was silent on what method would be used to develop the priorities, what role the inspectors would play, or how the specific shippers and consignees would be selected for inspection.

FRA's guidance is also silent with regard to inspectors' authority to cite shippers. Both the regulations and the Hazardous Materials Transportation Act are clear in mandating that shippers comply with safety standards, and that FRA, through its inspectors, has the power to enforce these requirements by issuing citations to those who do not comply. Nevertheless, the Enforcement Manual does not explicitly state that this authority exists.

Inspectors we interviewed did not generally understand their authority in this area, and were reluctant to cite a shipper even when violations were noted. Most inspectors believed they could only issue a violation after the shipper had released a tank car into transportation (i.e., transferred it to the railroad). This understanding would preclude inspectors from citing a shipper for improper loading of hazardous materials, even though the regulations specifically address these procedures. Inspectors said they would be extremely reluctant to cite a shipper, even if improper loading procedures were observed, without evidence that the tank car did not comply with regulations while in the custody of the railroad.

## No Systematic Approach to Inspection Process

The effectiveness of FRA's inspection program is reduced because inspectors independently determine how to carry out their inspection activities, and do not use a consistent, systematic approach. Inspectors spend the majority of their time inspecting railroad facilities. Shippers receive less inspection coverage, although the risk of hazardous materials releases is greater at their facilities. Current, detailed information that would identify high-risk shippers is not routinely given to inspectors to facilitate inspection planning. In addition, inspectors generally focus on inspecting tank cars rather than evaluating safety procedures.

## Information Inadequate to Target High-Risk Shippers

In our 1987 report on enhancing policy and program effectiveness at DOT,[3] we discussed ways to strengthen the management of safety programs and resources. Among other things, we emphasized the importance of targeting inspection resources at high-risk conditions. Such targeting involves the consideration of four elements: (1) risk measures (based on deficiency rates, unsatisfactory condition rates, or other measures of accident rates), (2) risk levels (e.g., deficiency rates), (3) factors that can predict risk that may exceed established guidelines, and (4) professional judgment of program managers.

The only one of these four elements that FRA uses extensively is professional judgment. FRA has information that would allow the consideration of risk measures, but has not effectively used it to target high-risk inspection points. FRA has not established either risk levels or factors that can predict risk that may exceed guidelines because, according to agency officials, accidents may occur that have no relationship to hazardous materials or any safety factors within FRA's control.

FRA program managers rely on the judgment of individual inspectors to select facilities for inspection and determine whether problems identified in an inspection should be formally documented in the inspection report. The Enforcement Manual provides no criteria for these decisions, so the process is not consistent among inspectors. Inspectors base their decisions about resource allocation on personal knowledge of inspection points in their territories and occasionally on data provided by headquarters about known hazardous materials problems.

FRA has also attempted to target its resources on the basis of risk measures, as reflected by large numbers of accidental releases of hazardous

[3]Department of Transportation: Enhancing Policy and Program Effectiveness Through Improved Management (GAO/RCED-87-3, Apr. 13, 1987).

materials or defects and violations found during previous inspections. To assist inspectors in monitoring and targeting shippers for inspection, FRA headquarters annually sends its regions a listing of past inspections conducted at shipper locations and a listing of all rail-related hazardous materials incident reports received from RSPA. Headquarters officials said that regional offices are expected to use the two listings to update inspection point lists and select inspection points with the highest risk.

This effort to target high-risk shippers is not entirely successful, however. We analyzed a listing from RSPA's accident/incident data base and found that, in 1986 and 1987, there were 78 shippers that reported 3 or more hazardous materials releases. FRA officials told us that any rail shipper with these many incidents should be investigated or inspected by a hazardous materials inspector within a year. However, 26 of these shippers (33 percent) were neither investigated nor inspected after the releases.

FRA officials acknowledged the importance of analyzing incident reports and inspection reports to target high-risk shippers for inspection. The Director, Office of Safety Enforcement, said that if inspection violations occur frequently for the same shipper, the inspector will follow up. Also, in a 1985 study,[4] DOT determined that effective monitoring of safety is directly dependent on the use and availability of such data as the inspection reports. The study noted that the regions have received training in the use of FRA's data systems and recommended that FRA increase regional ability to access the data.

However, the inspection and incident information provided annually to the regions are not current enough to be useful. Data in the incident listing we reviewed covered the previous 2 calendar years. According to one regional specialist, such information is too old to be of much use to the inspector in targeting high-risk shippers. He and another hazardous materials specialist believe that, to be effective, inspectors should not let too much time pass to discuss incidents with the responsible organization to ensure that the safety problem has been corrected.

In addition, the inspection listings currently produced by headquarters do not contain detailed information regarding shipper compliance, such as the types of defects found on an inspection and recommended violations. Inspectors may maintain their own files of inspection reports that

[4]Secretary of Transportation's Safety Review Task Force Report, February 1986.

contain this information. However, in the absence of summary inspection data, inspectors rely either on memory or an informal record-keeping system to track shipper compliance. Only two inspectors told us they maintain a summary of each shipper's compliance history; others said they have not developed such a system.

We also found that, although headquarters sends them, inspectors do not regularly receive incident and inspection data. Two of four regional specialists (who oversee the technical aspects of inspectors' work) said they do not routinely provide incident listings to inspectors that they receive from FRA headquarters. After reviewing them, these specialists did not provide the listings to inspectors. One regional specialist said that he was not aware that he should give the inspectors the listings. Two headquarters officials said that inspectors are not given more frequent incident data because they are already overburdened with information and paperwork.

## Inspection Does Not Focus on Safety Procedures

Inspectors do not routinely address the effectiveness of safety procedures at shipper and railroad facilities. Although the FRA guidance does not describe a specific approach to conducting inspections, we believe that inspections of safety procedures could provide greater assurance that the regulations are being followed. Federal regulations require that railroads have written operating rules and submit them to FRA, who reviews them. According to FRA, most major railroads submit copies of hazardous materials safety procedures with their operating rules. However, shippers are not required to have written procedures. As a result, FRA inspectors must visit shipper facilities to observe procedures or review written procedures (if available) to ensure that the shipper is complying with regulations.

However, the inspectors we observed generally concentrated their efforts on physically inspecting tank cars and reviewing shipping documents at each inspection point, a practice that, in our opinion, is not consistent and has limited effectiveness. When inspectors concentrate on inspecting tank cars, rather than reviewing safety procedures, they can only be certain that those particular cars are safe. On the other hand, if safety procedures are found to be adequate, the inspector would have greater assurance that all tank cars are being loaded and transported safely.

The inspections that shippers and railroads perform should ensure that safety regulations are being complied with. By reviewing the adequacy

and implementation of these procedures, FRA inspectors could make more efficient use of their available inspection time. Only 4 of the 12 inspectors we interviewed stated that they regularly review shippers' inspection procedures when performing their routine inspections.

The use of effective safety procedures can be critical to preventing accidental releases of hazardous materials. For example, an FRA inspector told us that he recently investigated a hazardous materials spill at a shipper's facility where a storage tank overflowed. The spill was a direct result of having no one observing the product as it was being unloaded, which is required by regulation. The inspector further found that the shipper had no written safety procedures incorporating the regulations. The shipper had been in business for at least 5 years but the inspector had not been aware of the lack of safety procedures until after the spill occurred.

FRA headquarters officials believe that the inspectors are concentrating on reviewing inspection procedures, even though several inspectors said that inspecting tank cars is more important. The Director, Office of Safety Enforcement, said that the current staff of hazardous materials inspectors, even if doubled, could not inspect every train carrying hazardous materials. He said that inspectors monitor safety procedures rather than railroads and tank cars.

## Inadequate Staffing to Effectively Implement Program

In our view, the number of hazardous materials inspectors is not sufficient to ensure that safety regulations are being complied with as long as inspectors continue to concentrate on inspecting tank cars. Inspectors choose their inspection points judgmentally, and can only inspect about 6 percent of the estimated carloads of hazardous materials transported annually. Currently understaffed by 6, the inspectors also do not achieve 2 key inspection goals of spending 60 percent of their time inspecting shippers and container manufacturers, and annually visiting all inspection points. State rail inspectors could provide assistance, but FRA is not authorized to certify them to perform federal hazardous materials inspections.

## All Rail Cars Cannot Be Inspected

Approximately 1 million carloads of hazardous materials have been transported by rail each year since 1985, according to AAR. In 1988, inspection reports showed that 65,513 cars (about 6 percent) were inspected. Over the 5-year period from 1984 to 1988, tank car inspections averaged about 67,000. Since the inspected cars were judgmentally

selected by the inspectors, the results of these inspections cannot be used to estimate the number of unsafe shipments moving by rail. While we believe that this type of information would be vital for statistically valid monitoring of the movement of hazardous materials, we know of no source of data available to FRA containing types, amounts, and times of hazardous materials shipments that would allow FRA to draw a statistical sample and develop information on the number of unsafe shipments moving by rail. Currently, FRA inspections can only ensure that those tank cars that are inspected are safe. In our view, FRA inspector resources would never be adequate to inspect the total number of tank cars and ensure their safety.

In addition to the regular tank cars that carry hazardous materials, approximately 40,000 intermodal tanks must also be considered in the inspection process. According to FRA's headquarters Hazardous Materials Specialist, these cars are used to meet transportation needs different from those of regular tank cars, and therefore represent an increase in the universe of hazardous materials rail containers, rather than replacements of existing shipping containers. As such, they represent additional work for the FRA inspectors. Statistics on the use of these portable tanks are not readily available, but representatives from the railroads and AAR indicated that their use is growing.

## Two Key Inspection Goals Not Achieved

In 1987 and 1988, FRA inspectors did not achieve the 2 key hazardous materials inspection goals of spending 60 percent of their time inspecting shippers' and container manufacturers' facilities, and annually visiting all inspection points (as required by 3 of the 4 FRA regions we visited). This resulted not only from poor guidance and not using a systematic approach, but also from insufficient staffing.

As discussed previously, FRA inspectors did not allocate their time to meet the old 60/40- or the current 80/20-percent time allocation goal established by headquarters for shippers and railroads. Planned allocation of time averaged 33 percent to shippers and 67 percent to railroads in 1988. The actual time allocation between shippers and railroads, calculated from the numbers of inspections performed by hazardous materials inspectors in 1988, averaged 41 percent for shipper facilities. Some hazardous materials inspections were also performed by FRA operating practices inspectors. Over the 5-year period 1984 to 1988, total hazardous materials inspections were divided between railroads and nonrailroads (shippers, consignees, freight forwarders, and equipment manufacturers) as shown in table 2.1. FRA did not achieve either its

older goal of allocating 60 percent of inspector time to nonrailroads, or the current goal of allocating 80 percent.

**Table 2.1: Number of Hazardous Materials Inspections, 1984-88**

| | Railroad | | Nonrailroad | | |
|---|---|---|---|---|---|
| Year | Number | Percent | Number | Percent | Total |
| 1984 | 6,252 | 72 | 2,432 | 28 | **8,684** |
| 1985 | 5,905 | 68 | 2,751 | 32 | **8,656** |
| 1986 | 6,291 | 69 | 2,770 | 31 | **9,061** |
| 1987 | 5,923 | 71 | 2,412 | 29 | **8,335** |
| 1988 | 5,280 | 67 | 2,598 | 33 | **7,878** |

Source: FRA Hazardous Materials Inspection Data Base.

Coverage of known inspection points during 1988 was even less effective than achieving the time allocation goal. The inspection reports for 1988 disclosed that inspections were conducted at less than 50 percent of the known inspection points in all but 2 of the 11 territories we reviewed. Six of the inspectors covered less than 30 percent of their territory in 1988, and many inspectors inspected a substantially lower percentage of known shipper facilities than railroad facilities. Inspection coverage also differed between inspectors within the same region. In Region 7, coverage of known inspection points ranged from 21 percent in 1 territory to 83 percent in another. The inspectors with the greatest number of inspection points said that it was impossible for them to visit each inspection point once a year.

Regional hazardous materials specialists in three of the four regions we reviewed said that inspection goals were not being achieved because there are not enough inspectors. Most FRA inspectors told us they are unable to cover all known inspection points in their territory each year because of the many demands placed on them, the size of their territories, and other priorities. The 12 inspectors for whose inspection data we reviewed were responsible for covering 2,312 known inspection points located in 17 states, yet actually inspected only 699 of these points (out of 2,427 inspections). Over 50 percent of the known inspection points were not inspected over a 2-year period.

FRA currently has 34 authorized positions for hazardous materials inspectors. Six of these positions are vacant, leaving the coverage of each of the associated territories to be handled by 1 of the 28 inspectors that were on board as of May 1989. We also found that 5 of the 28 inspectors have enough years in federal service to retire at any time.

Because of budget restrictions, however, FRA is not actively seeking personnel to fill the vacant positions. In addition, FRA officials told us that it takes up to 2 years to adequately train a new inspector, depending on the person's previous experience.

FRA officials also said they have found it difficult to attract personnel who have the technical background that would reduce the need for the 2-year training period. Despite this potentially long training, the Director, Office of Safety Enforcement, told us that FRA would not consider hiring additional staff prior to the retirement of fully qualified inspectors.

## State Hazardous Materials Inspectors Could Help

According to the 1988 National Governors Association Report to DOT, 21 states have adopted federal hazardous materials regulations in whole or in part. Twelve of these states have their own hazardous materials inspection programs.

However, state hazardous materials inspectors are not certified by FRA to conduct federal safety inspections, unlike state inspectors in four other rail safety disciplines.[5] These other rail safety inspectors from 32 states are trained and certified by FRA; in 1988, 104 inspectors were employed in this capacity. Their inspection efforts are coordinated with FRA regional staff, and their reports are forwarded to FRA for processing. FRA funded approximately 14 percent of these programs in 1988, but no funds were available from the federal government in 1989.

The authority for certifying these inspectors was granted through amendments to the Federal Railroad Safety Act. An FRA official said that each time the act is due for reauthorization, states are surveyed to determine if they want additional inspection authority. This official said that in the past, states have not indicated an interest in obtaining the authority to perform hazardous materials inspections. FRA has not sought the necessary legislative authority to permit states to conduct such inspections.

We found that several states were interested in being certified and trained by FRA to conduct hazardous materials inspections. We talked to state officials responsible for rail safety in four states—California, Illinois, Pennsylvania, and Texas. Officials in three states were interested

[5](1) Motive Power and Equipment, (2) Operating Practices, (3) Track Inspections, and (4) Signal and Train Control.

in receiving more training from FRA. The fourth state we visited did not regulate hazardous material transportation by rail. Nevertheless, the state official interviewed said he would be in favor of such a program if federal funding and certification became available.

We believe that any assistance from qualified state inspectors would ease the burden on FRA's inspectors. FRA funded the state rail inspector grant program at only 22 percent of cost in 1988, according to a statement by FRA's Administrator at appropriations hearings. Currently, the grant program is unfunded, yet states still participate. We believe it would be more cost effective for FRA to help train and certify state railroad inspectors to perform hazardous materials inspections than adding an equivalent number to FRA's permanent inspection staff.

## Conclusions

We believe that FRA does not provide adequate guidance to its hazardous materials inspectors. The Hazardous Materials Enforcement Manual, the only agencywide written guidance, is silent or unclear about (1) how often shippers should be inspected, (2) how shippers and railroads should be selected for inspection, (3) how and when inspection point lists should be updated, and (4) inspectors' authority to cite shippers for violating the regulations. As a result, inspectors make their own decisions in these areas, resulting in inconsistent implementation of the inspection program. Also, inspection goals that have been established at both the headquarters and regional levels may be contradictory and have not been clearly communicated to the inspectors. Therefore, overall achievement of program goals is inefficient and ineffective.

In our view, FRA needs to implement its hazardous materials inspection program in a more efficient and effective manner. There are substantive differences between what headquarters officials perceive is being done during inspections, versus what we actually found. Inspectors concentrate their efforts on tank car inspections rather than evaluating safety procedures of shippers and railroads, which would give better assurance that all hazardous materials shipments were safe. This approach is inefficient not only because inspectors can only cover about 7 percent of the universe of tank cars, but also because inspection points (and therefore tank cars) are selected judgmentally and thus provide no assurance that other tank cars are safe.

We also believe inspector resources are not sufficient to effectively carry out the inspection program as intended. Inspectors are not able to achieve the goals of the program overall, either for time allocation or for

annual coverage of all inspection points. Six of 34 authorized inspector positions are vacant, but FRA is not actively seeking people to fill them because of budget restrictions. FRA has not asked Congress to give it the authority to certify state hazardous materials inspectors so they could assist the FRA inspectors as they do in the other rail safety disciplines.

## Recommendations

We recommend that the Secretary of Transportation direct the FRA Administrator to take the following steps:

- Update the Enforcement Manual to provide consistent guidance, including agencywide goals and objectives, and clarify inspectors' authority to write violations at shipper facilities before rail cars are transferred to railroads for transportation.
- Establish a new inspection approach that includes (1) identifying high-risk shippers and railroads, and targets them for inspection and (2) emphasizes concentrating on reviewing safety procedures and secondarily inspecting tank cars.
- Initiate a study of the staffing needs for realistic program implementation, considering the changes in objectives and procedures developed as a result of the recommendations in this report.
- Perform a comprehensive survey of states with railroad inspection programs to determine the degree of interest in allowing state inspectors to perform hazardous materials inspections. If so indicated by the results, DOT should request legislative changes that would authorize state participation in the federal hazardous materials inspection program.

# Action Still Needed to Improve RSPA Data and Identify Hazardous Materials Shippers

Both OTA and we have criticized RSPA for having inaccurate and incomplete information in its hazardous materials data base. Although RSPA has recently changed its form for reporting hazardous materials incidents, more improvements are needed to correct these longstanding and continuing problems. In particular, RSPA does not (1) routinely use other data sources to verify the accuracy and completeness of the information in its data base, (2) require updated incident reports when data changes from the original report, and (3) require shippers to report hazardous materials incidents. In addition, despite recommendations to do so by both OTA and us, RSPA has not established a program to register hazardous materials shippers, and therefore does not have accurate data on the organizations being regulated.

## RSPA's Hazardous Materials Data Base

RSPA is the official DOT repository of information on hazardous materials releases. Any unintentional release of hazardous materials during transportation or during loading, unloading, or temporary storage related to transportation must be reported to RSPA in writing as prescribed by federal regulations.[1] A contractor for RSPA's Office of Hazardous Materials Transportation enters this information into the HMIS, which OTA found to be the best available source of information on hazardous materials spills. According to OTA, the HMIS data base is extremely important as the basis for most studies of hazardous materials transport safety in the United States.[2] FRA uses HMIS information to assist its inspectors in planning and carrying out hazardous materials inspections.

## RSPA Has Made Improvements to HMIS

In existence since 1971, the HMIS has been criticized by both us, in 1980, and OTA, in 1986, for being incomplete and inaccurate. Numerous recommendations to improve the data base that have since been implemented or partially implemented by RSPA include

- expanding the information required to be reported on a hazardous materials release,
- extending the time period for filing the release report to allow for more accurate information,
- increasing staff to ensure accurate recording of HMIS data,

[1] 49 C.F.R., Sections 171.15, 171.16, 174.45, and 174.48.

[2] Transportation of Hazardous Materials, Office of Technology Assessment, OTA-SET-304 (Washington D.C.: U.S. Government Printing Office, July 1986).

- pursuing misreporters and nonreporters of hazardous materials releases, and
- better educating the industry on reporting requirements and current reporting deficiencies.

RSPA has recently increased the information required on its reporting form to improve HMIS' accuracy and completeness. The report form (DOT F 5800.1, "Hazardous Materials Incident Report") has been revised through a change in the regulations. The report form, which must be used as of January 1, 1990, now contains expanded, structured questions about cause, characteristics, and consequences of incidents that will increase the amount of information about the incident, make answers more consistent, and make data entry easier. RSPA also added more detailed questions about costs, persons evacuated and injured, and other consequences of the incident. In addition, the time limit for submitting the incident report was extended from 15 to 30 days.

Because they had not become effective before issuance of this report, we could not determine how well these changes will improve the information in the HMIS. We compared HMIS data on a number of railroad accidents involving hazardous materials with similar data from FRA and the National Transportation Safety Board (NTSB). Both FRA and NTSB obtain their information independently, FRA through its own accident report forms and NTSB through investigations by its own personnel. Although there were some discrepancies,[3] we found that most of the information in HMIS was consistent with information from the other agencies.

To ensure accurate recording of HMIS data, RSPA doubled its contractor staff from 8 to 16 persons, and increased its own staff from 3 to 4 between 1986 and 1988. Also, to identify and pursue nonreporters and misreporters, RSPA contractor staff use a computer program to compare written HMIS incident reports with information from the U.S. Coast Guard's National Response Center on the same incident. When the two do not match, a list is generated and sent to enforcement staff for appropriate action against nonreporters. Over a 2-year period, this resulted in the initiation of 52 enforcement actions. RSPA contractor personnel also run computer checks of some of the information to identify inconsistencies, and conduct manual post-entry reviews of 5 percent of all reports to check for errors.

[3]See page 33 for detailed discussion.

In response to the recommendation that RSPA better educate the industry on reporting requirements, the revised reporting form does not contain additional instructions. It does, however, state that guidelines are available for completing the report. The guidelines discuss legislative requirements, regulations, and specific steps to be followed in reporting hazardous materials incidents.

## Some Problems Remain Uncorrected

In addition to the recommendations that RSPA has implemented, other problems we identified in 1980 were found by OTA to persist in 1986, and were identified as continuing during our 1989 review. The recommendations to correct these problems include

- updating information in HMIS when significant changes in reported information occur,
- requiring shippers to report hazardous materials releases in addition to the carriers who currently report, and
- using other data sources (data sharing) to better ensure that all releases are being reported as required.

In addition, we found that HMIS continues to be incomplete, despite efforts to ensure that all hazardous materials incidents are accurately reported.

### Updating Information and Requiring Shippers to Report

RSPA has not established a requirement that the reporting entity revise hazardous materials incident information if data originally submitted change significantly. An official stated that carriers are encouraged to revise reports in such circumstances, and have done so in the past. We did not determine how effective this voluntary effort might be.

RSPA has also not required shippers to report hazardous materials incidents, in addition to the carriers who presently make reports. The Director, Office of Hazardous Materials Transportation, said that RSPA's jurisdiction does not begin until the hazardous materials container is transferred to a railroad or any carrier.[4] He also said that the Paperwork Reduction Act would make it difficult to add a reporting burden to shippers. We believe that in the case of rail shippers, the lack of reporting to HMIS is a serious deficiency, considering the estimates that

[4]The Hazardous Materials Transportation Act gives DOT the authority to regulate the movement and related loading, unloading, and storage of hazardous materials. Therefore, DOT could require shippers to report on hazardous materials incidents occurring before a shipment is given to a railroad for transportation.

75 percent or more of all hazardous materials releases can be traced to safety problems at shipper facilities.[5] It hinders the effectiveness of other modal agencies, such as FRA, that use HMIS data to schedule inspections at points of greatest risk.

## Limited Data Sharing With Other Agencies

RSPA has not effectively responded to OTA and our recommendations that RSPA use other data sources, such as reports to NTSB and the Occupational Safety and Health Administration, emergency service reports, or reports made to other modal agencies, to better ensure that all incidents are being reported as required and that, where not, appropriate enforcement actions are taken. OTA, in particular, questioned the integrity of HMIS for both unreported and inaccurately reported incidents. Also, the Secretary's Safety Review Task Force[6] similarly recommended in February 1986 that RSPA coordinate the HMIS with other systems where shared data could be of benefit.

As a result of these recommendations, RSPA formed an intermodal working group on enforcement. This group generated four options for sharing enforcement data, but recommended that a feasibility study be performed to determine which of the two "best" options would be more cost effective. Although these options were proposed in August 1986, the feasibility study was never performed. Another DOT agency was tasked with evaluating the options, along with analyzing numerous other actions that have been taken to respond to recommendations about HMIS made by us, OTA, and other groups. The report has been received by RSPA, but had not been accepted as of September 1989.

We were told that RSPA has been seeking cooperation with outside agencies to share data on hazardous materials releases, but that the lack of a single identifying code number is a serious impediment. RSPA is considering the creation of a data base bridge to allow for cross-modal searches, but has not taken action in this regard as of September 1989. Incompatible hardware and software used for data storage is a continuing problem for both intra- and interagency data sharing.

For the most part, RSPA's data-sharing efforts have been structured toward allowing others to access HMIS more easily. In this regard, it has

[5]According to statistics from AAR, as many as 94 percent of the unintentional releases in 1988 could be traced to problems at shipper facilities.

[6]Secretary of Transportation's Safety Review Task Force Report, February 1986.

developed menu-driven software that allows others to obtain information from HMIS without being familiar with HMIS software. However, RSPA has done little to get information from other sources, not only because the software between systems is not compatible, but also because the data in other systems are collected to meet different requirements that are not comparable to RSPA's requirements.

According to a RSPA official, HMIS obtains limited data from the National Response Center that are also sent to EPA. RSPA, EPA, and the Coast Guard have regulations requiring those who release hazardous materials to report to the Response Center by telephone within 24 hours of the release. Both RSPA and EPA are notified of the telephonic reports on a daily basis. However, only the most serious releases—usually those involving evacuation, injury, or death—must be reported to this system. Other written reports submitted to EPA are not obtained by RSPA. As a result, RSPA's ability to verify the accuracy and completeness of all its data through comparisons with other comparable data is limited.

Other actions have been taken to promote greater consistency in the various DOT hazardous materials data bases, but also have limited effectiveness. RSPA and FRA have exchanged tapes of hazardous materials accident and incident data, and RSPA is planning to compare the two to see whether serious discrepancies or omissions exist in its data. This is a onetime exploratory effort, however, and it is not expected to be performed routinely because of staff limitations. A RSPA official said that the comparison has a lower priority than other efforts and has not yet been performed. Similarly, FRA has used the RSPA tapes in the past to ensure the accuracy and completeness of its own data, but no longer has the resources to perform this comparison.

## Hazardous Materials Data Base Not Complete

In connection with our current analysis of RSPA and FRA, we found that HMIS still does not contain complete information on hazardous materials rail accidents. Some accidents identified in the FRA data base did not appear in HMIS, even though all accidents that are reported to FRA should also be reported to HMIS. We believe there are a number of reasons why this should occur, including inadvertent or deliberate nonreporting by the organization involved in the accident. However, RSPA's controls should be sufficient to detect such underreporting, and pursue those who do not submit reports when regulations require them to do so. Because they are not sufficient, RSPA does not have assurance that HMIS contains complete information on transportation-related hazardous materials incidents.

In calendar year 1987, 50 rail accidents involving hazardous materials were reported to FRA and should have been reported to RSPA. However, we found that 14 of these accidents (28 percent) were not recorded in HMIS. According to FRA records, the 14 accidents caused damage totalling over $3 million and involved the evacuation of 1,160 people.

The percentage of accidents reported to FRA and not RSPA declined to 20 percent in calendar year 1988 (9 of 46 accidents). Over the 2-year period, damage was estimated at $4.7 million, and 1,400 people were evacuated as a result of these accidents.

We also noted that some discrepancies exist between data reported to FRA versus RSPA on rail accidents. We reviewed original report documents on 12 accidents that were reported to and/or investigated by FRA, RSPA, and NTSB during the years 1986-88. We compared matching information in the reports from each group to determine the consistency of reporting. For the most part, the information in HMIS accurately reflected information in the other data bases. However, in two cases hazardous materials release information differed between the three organizations. In six of the cases, injuries were reported inconsistently, as were fatalities in two others. However, RSPA requires only reporting of injuries and fatalities that resulted from the release of hazardous materials. Because of differences in reporting definitions, we could not determine which organization's reports contained the correct information.

The differences in information reported to HMIS versus other data systems, and particularly the omissions from the HMIS compared with FRA's accident data base, indicate that the mechanism for collecting information on hazardous materials accidents and incidents is faulty. Because of staff limitations, simple data comparisons are not being performed to ensure that all required reports are submitted and that nonreporters are detected. The onetime effort to match FRA's accident data tapes to HMIS' (discussed above) could improve this condition, but such a comparison would need to be done routinely to ensure that the situation did not recur.

## No Registration of Shippers

Both we and OTA recommended that hazardous materials shippers be required to register with RSPA, noting that DOT has incomplete knowledge of the organizations that are being regulated. While it has the authority to require registration of all shippers, officials said RSPA is considering

only a limited registration program for highway shippers of a few specific commodities, such as Class A or B explosives or hazardous materials designated as extremely toxic by inhalation.[7] As a result, rail shippers are identified only through an inspection process that, at best, does not systematically seek out new or existing shippers; and at worst, is haphazard or ineffective in doing so, as discussed in chapter 2. In our view, FRA lacks assurance that these shippers are being inspected and are following the hazardous materials safety regulations that apply to them.

## No Systematic Identification of Shippers

Neither FRA nor RSPA systematically identifies rail shippers of hazardous materials. DOT regulations contain specific requirements for the loading and unloading of hazardous materials, and only by inspecting these facilities can FRA ensure that the regulations are being followed. FRA relies in part on information derived from HMIS to identify these shippers. However, because RSPA does not have a mechanism to identify these shippers, FRA's ability to carry out its responsibilities under the regulations is limited.

Currently, FRA inspectors update lists of known shippers through physical siting during inspection trips and review of shipping documents while inspecting railroad facilities. Also, headquarters officials told us they annually distribute printouts to the regions containing the names of shippers and railroads that reported hazardous materials releases. These officials believe that inspectors are generally able to identify 95 to 100 percent of bulk hazardous materials shippers using these methods. As discussed in chapter 2, however, this action may not be effective since many inspectors do not receive the lists or find them to be too old to be useful.

While we agree that thorough reviews of shipping documents while inspecting railroads is potentially an effective means of identifying hazardous materials shippers, we found that this part of the inspection process was generally neglected by six inspectors we observed. One inspector checked hundreds of documents in just a few minutes, and did not attempt to match them with shipper locations on their inspection point lists. The other five inspectors did not review shipping documents at all.

[7]Regulations currently require registration of shippers of flammable cryogenic liquids.

The inspectors we spoke to had various ways of identifying new hazardous materials shippers such as checking telephone directories, reviewing waybills, asking railroad staff, and reading newspapers. Also, several said they identified shippers by simply driving around the area and noting any new companies that appeared to be involved in hazardous materials products. In our view, however, these methods are not systematic and would not ensure that all hazardous materials shippers are identified. In particular, small and seasonal shippers would be likely to remain undetected. One hazardous materials specialist told us that such shippers may be more likely to have safety problems than large, well-known shippers that can afford to train personnel to handle hazardous materials as the regulations require.

## RSPA Has Authority to Register Shippers

RSPA has the authority to require the registration of all hazardous materials shippers, but has so far declined to do so. A study conducted by RSPA in 1987 evaluated methods of obtaining additional data on carriers, shippers, and manufacturers of hazardous materials containers. However, a report was never finalized, and no action has been taken. A RSPA official involved in the study said that it only considered highway shippers, but that most rail shippers also ship by highway and would therefore be included in the study's findings.

This official said that any registration program would have to be established through a formal rule-making process that would take 2 or more years to complete. At this time, RSPA has not initiated such a process. He also said that a registration program is really not necessary because information is already available to identify shippers. The Interstate Commerce Commission annually selects a sample of waybills for rail transportation, and records the information in a data base. Among other things, waybills include the name and address of the shipper as well as the commodity being shipped. This system can probably identify most hazardous materials rail shippers in the country.

Although RSPA has access to these data, the RSPA official said it is considered proprietary and confidential. Several RSPA and FRA officials said the waybill data reveal sensitive information on hazardous materials shipments that, if released to the public, could seriously affect the competitive positions of railroads. The information must be protected as if it were classified, and RSPA has therefore made no attempt to use it, they said. Regardless of the sensitivity or usability of the waybill data, we still believe RSPA needs a reliable means of identifying the shippers it

must regulate. If the waybill data cannot be used, RSPA should establish some other system to identify them.

## Conclusions

Despite recent RSPA actions to correct weaknesses in its hazardous materials program, additional steps are needed to improve the completeness of HMIS. RSPA has taken a number of actions to improve its data base, including revising the hazardous materials incident reporting form, extending the reporting time frames, and increasing staff to record incident data. However, RSPA still has not taken action to respond to other recommendations we believe are still valid, such as (1) requiring submission of revised HMIS reports when substantial changes occur in previously reported data, (2) using other data sources to better ensure the completeness of its data, and (3) coordinating with other data systems to ensure the accuracy of its data.

The HMIS data base contains less information than it should because some rail accidents involving hazardous materials releases are not reported. Twenty-three accidents, resulting in evacuations of thousands of people and millions of dollars in damages, were reported to FRA, but not HMIS, in 1987 and 1988. Routine comparisons of FRA and HMIS data are not being performed to identify these unreported accidents. As a result, nonreporters are not being identified and enforcement action is not being taken.

DOT has declined to implement a program to register hazardous materials shippers, despite recommendations to do so by both us and OTA. Therefore, RSPA has only limited knowledge of the organizations it regulates. While EPA may have more data on these shippers, RSPA does not obtain much of this information. It is therefore not effective in identifying the universe of hazardous materials shippers. As a result, other transportation administrations, such as FRA, do not have access to a definitive source of shipper information to focus their hazardous materials inspection and enforcement activities.

## Recommendations

We recommend that the Secretary of Transportation direct the Administrator of RSPA to improve the completeness of the hazardous materials incident reporting system by the following:

- Requiring that hazardous materials incident reports be submitted by all firms, such as shippers, involved with any aspect of transportation as defined in the Hazardous Materials Transportation Act.

- Establishing a procedure to routinely compare HMIS data with similar data in other systems, such as FRA data on railroad accidents involving hazardous materials releases. This would (1) improve the accuracy and completeness of HMIS data and (2) identify nonreporters. Where nonreporters are identified, appropriate enforcement action should be taken.
- Requiring reporters of hazardous materials incidents to submit revised incident reports if significant changes occur in previously submitted reports.

In addition, we recommend that the Secretary direct the Administrator to follow through on our 1980 recommendation to establish a mandatory registration program for hazardous materials shippers.

# Top 25 Hazardous Materials by Rail Volume - 1988

| Rank | Commodity Name | Volume in Carload Originations |
|---|---|---|
| 1 | Mixed shipments | 213,325 |
| 2 | Liquified petroleum gas | 133,961 |
| 3 | Sodium hydroxide | 85,487 |
| 4 | Anhydrous ammonia | 54,753 |
| 5 | Chlorine | 52,040 |
| 6 | Sulfuric acid | 51,114 |
| 7 | Methyl alcohol | 27,617 |
| 8 | Phosphoric acid | 27,006 |
| 9 | Fuel oil | 25,137 |
| 10 | Ammonium nitrate | 17,551 |
| 11 | Styrene monomer, inhibited | 16,914 |
| 12 | Gasoline | 11,945 |
| 13 | Hydrochloric acid | 11,468 |
| 14 | Carbon dioxide, refrigerated liquid | 11,193 |
| 15 | Crude oil petroleum | 10,574 |
| 16 | Hazardous substance, n.o.s. | 9,338 |
| 17 | Denatured alcohol | 8,982 |
| 18 | Ethylene oxide | 7,594 |
| 19 | Petroleum naptha | 7,511 |
| 20 | Adipic acid | 6,769 |
| 21 | Phenol/carbolic acid | 6,667 |
| 22 | Hexamethylene diamine solution | 6,388 |
| 23 | Vinyl acetate | 5,409 |
| 24 | Propylene oxide | 5,344 |
| 25 | Flammable liquid, n.o.s. | 4,866 |
| **Total, top 25** | | **837,985** |
| **Total, all other** | | **315,941** |
| **Grand total, all hazardous materials** | | **1,153,926** |

Source: AAR Annual Report on Hazardous Materials Transported by Rail, 1988.

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