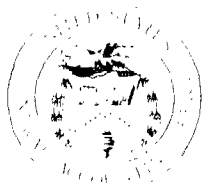


July 1990

# RAILROAD SAFETY

## New Approach Needed for Effective FRA Safety Inspection Program



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United States  
General Accounting Office  
Washington, D.C. 20548

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

B-240287.1

July 31, 1990

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

The Honorable Carl Levin  
Chairman, Subcommittee on  
Oversight of Government Management  
Committee on Governmental Affairs  
United States Senate

In response to your request, this report addresses the adequacy of the Federal Railroad Administration's (FRA) railroad safety inspection program. Specifically, the report discusses FRA's inspection coverage standards, how FRA uses data to target inspection activities, follow-up actions on inspections, and uniformity in the application of safety regulations by inspectors. The report makes recommendations for improvement in FRA's inspection program.

As agreed with your offices, 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 the Secretary of Transportation; the Administrator of the Federal Railroad Administration; and other interested parties. We will make copies available to others upon request.

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



J. Dexter Peach  
Assistant Comptroller General

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# Executive Summary

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## Purpose

In 1989, 249 Federal Railroad Administration (FRA) and 110 state railroad inspectors were responsible for inspecting the nation's 580 railroads, which owned approximately 20,000 locomotives, 1.2 million freight cars, and 258,000 miles of track. These inspectors conducted about 63,300 inspections and found over 378,000 safety problems. Concerned about railroad safety, the Chairman, House Committee on Energy and Commerce, and the Chairman, Subcommittee on Oversight of Government Management, Senate Committee on Governmental Affairs, asked GAO to assess the effectiveness of FRA's safety inspection program. This report, the third in a series, focuses on FRA's inspection coverage standards, how FRA uses data to target railroads for inspection, follow-up actions on inspection results, and uniformity in the application of safety regulations.

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## Background

As an agency of the Department of Transportation (DOT), FRA is responsible for establishing and enforcing safety regulations for the railroad industry. To carry out this responsibility, FRA has issued safety regulations that railroads must follow covering track, signals, equipment, and operating practices. The railroads are primarily responsible for inspecting their operations to ensure that they conform to FRA's regulations. FRA and state inspectors, under a cooperative agreement with FRA, monitor railroad compliance with these regulations by routinely conducting inspections at railroads. If inspectors find deviations from FRA's safety regulations (defects), their inspection reports identify the defect thereby notifying the railroads that unsafe conditions have been found that must be corrected.

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## Results in Brief

FRA's safety inspection program does not provide assurance that the nation's railroads are operating safely. GAO found that FRA did not have minimum inspection coverage standards defining the frequency of railroad inspections or the size of the territory an inspector could be expected to cover. Without such standards, some railroads go uninspected, and FRA does not know whether its staff is adequate. Also, FRA does not systematically target inspections by integrating available accident, injury, and inspection data. Rather, FRA relies on inspectors' judgment and knowledge to plan inspections, which could result in high-risk areas receiving decreased inspection activity. In addition, FRA neither requires railroads to report actions taken to correct identified safety problems, nor does it have a systematic follow-up inspection program to determine if railroads correct safety problems. Therefore, FRA has no

record to show whether the thousands of safety problems it has identified have been corrected. Finally, GAO found that inspectors were not uniformly applying FRA's safety regulations, which resulted in FRA regions filing different numbers of violations for the same defective condition.

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## Principal Findings

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### Inspection Coverage Standards Not Established

FRA has not established inspection coverage standards for the various types of inspections. As a result, inspectors do not have guidance on how often railroads' equipment, track, signals, or operating practices need to be inspected. FRA also has no standards relating to the size of an inspector's territory or how much territory an inspector could be expected to cover. The lack of coverage standards has resulted in some railroads not being inspected. GAO found that in 1989 some railroads did not receive any type of inspection. Typically, these were the smaller, short-line railroads, which have higher accident and injury rates than overall industry averages. Specifically, in 1989, of the nation's 500 railroads, 32 received no inspection of any type, 168 did not receive an inspection of their operating practices, 151 did not have their equipment inspected, and 75 that owned track did not receive a track inspection.

Because there are no coverage standards, FRA does not know whether its staff of 249 inspectors and 58 supervisory personnel, augmented by 110 state inspectors who conduct inspections for FRA, is adequate. FRA officials in the regions visited told GAO that resources were not sufficient to adequately cover their territories. In addition, many state directors told GAO that they were reducing or considering reducing their inspection efforts for FRA due to the elimination of all federal funding for state inspection programs in 1989. Such reductions will further affect FRA's ability to adequately cover the nation's railroads.

### Data Not Analyzed to Target Inspections

GAO's 1987 management review of DOT found that safety indicators need to be developed in order to target inspection resources.<sup>1</sup> One safety indicator is the number of times that railroads are found to be in compliance

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<sup>1</sup>Department of Transportation: Enhancing Policy and Program Effectiveness Through Improved Management (GAO/RCED-87-3, Apr. 13, 1987).

or non-compliance with FRA's regulations. Those in frequent non-compliance should be targeted more often for inspection. FRA, however, does not analyze existing inspection and accident data to target railroads for inspection. Rather, the selection of railroads for inspection is based on individual inspector judgment and knowledge, not on an analysis of existing safety data to determine where safety problems are occurring and to direct inspections to those problems.

GAO found little relationship between changing accident trends, another safety indicator, and FRA inspection activity. For example, while the number of Union Pacific accidents in Idaho more than doubled between 1986 and 1988, the total number of Union Pacific inspections in Idaho decreased nearly 38 percent.

Also, in 1980, the Congress required FRA to submit a system safety plan. As part of the plan, FRA was directed to develop an inspection methodology that was to consider, among other things, carrier safety records, population centers, and volume of track and equipment used in passenger and hazardous materials routes. As a result, FRA developed the National Inspection Plan, but the plan has not fully met the congressional mandate. The number of inspections in the plan are based on the number of inspections previously conducted rather than on a methodology that uses information on carrier safety records or the volume of passenger and hazardous materials traffic in specific locations. FRA has not developed the methodology the Congress envisioned because it lacks information on the volume of track and equipment used in passenger and hazardous materials routes, which it is now in the process of gathering.

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## Ineffective Follow-Up

FRA does not know whether thousands of the safety defects it identified have been corrected because it does not require railroads to report actions taken to correct safety defects. Railroads voluntarily report actions taken to correct defects identified during some FRA inspections, but this voluntary reporting is incomplete. GAO found that between 1986 and 1988, track inspectors found 360,683 track defects and signal inspectors found 34,813 signal defects. FRA had no record of actions taken by the railroads to correct nearly 40,000 (about 11 percent) of the track defects and 5,039 (about 14 percent) of the signal defects. Some railroads report actions taken to correct equipment and operating practices defects, but FRA does not maintain records of these reports. FRA, therefore, does not know whether the approximately 6,000 operating practices and 200,000 equipment defects cited each year were corrected.

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FRA, as a matter of practice, does not routinely perform follow-up reinspections to determine whether safety defects are corrected. In those cases where an FRA reinspection was performed, GAO found examples of previously cited track and signal defects not corrected by the railroad. Upon reinspection, these defects were cited as serious violations.

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### Application of Safety Regulations Not Uniform

The Federal Rail Safety Act of 1970, as amended, requires that FRA inspectors uniformly apply safety regulations throughout the railroad industry. GAO's analysis of inspection activities for 1986 through 1988 showed that uniform application of safety regulations was not being achieved, which results in FRA regions filing different numbers of violations for the same defective safety condition.

GAO found numerous examples of one FRA region filing many more violations than another for the same defective condition between 1986 and 1988. In 1988, one FRA region cited one certain track defect 312 times but filed no violation reports, while another region found the same problem 433 times and cited it as a violation in 165 cases. GAO also found that a number of inspectors had a pattern of not citing railroads for violations. Uniformity problems exist because guidance has been unclear for issuing violations and training has been inadequate.

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### Recommendations

GAO is making a number of recommendations to the Secretary of Transportation that will provide FRA with a better measure of whether the nation's railroads are operating safely. These recommendations include defining inspection coverage, refining its approach to targeting inspections, and establishing a follow-up inspection program. GAO is also recommending actions to ensure that safety standards are uniformly applied.

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### Agency Comments

GAO discussed its findings with the Administrator, FRA, who generally agreed with GAO's findings, especially the need to make the inspection approach less random and more scientific by using available data. He also said that FRA was hiring a Director of Training and Communication who would (1) design training programs for both new and current inspectors to ensure that they have analytical capabilities and (2) keep inspection manuals up-to-date to better ensure uniformity in applying safety standards. As requested, however, GAO did not obtain written agency comments on a draft of this report.

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**Abbreviations**

AAR	Association of American Railroads
DOT	Department of Transportation
FRA	Federal Railroad Administration
GAO	General Accounting Office
RIRS	Railroad Inspection Reporting System



# Introduction

The Federal Railroad Safety Act of 1970, as amended, directed the Secretary of Transportation to prescribe regulations for all areas of railroad safety. The Secretary has delegated these responsibilities to the Federal Railroad Administration (FRA). FRA's safety mission includes (1) establishing federal rail safety rules and standards; (2) inspecting rail carrier track, signals, equipment, and operating practices; and (3) enforcing federal safety rules and standards. The nation's railroads are primarily responsible for conducting safety inspections of their equipment and facilities. FRA's responsibility is to monitor the inspection activity of the railroads. The railroads employed approximately 35,000 track and signal personnel, and 75,000 motive power and equipment maintenance people in 1987.

## FRA's Approach to Railroad Safety

To carry out its safety mission, FRA has established five inspection disciplines and eight regional offices under the direction of an Associate Administrator for Safety in Headquarters. Inspectors specialize in one discipline and are generally not cross-trained. Each discipline and a brief description of the inspectors' responsibilities follow:

- track: enforcement of Federal Track Safety Standards, including commuter track;
- locomotive power and equipment: all aspects of the design and operation of rolling railroad equipment, including locomotives;
- operating practices: enforcement of federal operating regulations, carrier rules and practices, and train operations;
- signal and train control: all aspects of signal switching systems, train control, and locomotive cab signal devices; and
- hazardous materials: all aspects of the rail transportation of hazardous materials, including the enforcement of safety regulations at shippers and railroads.

The primary responsibility of the inspectors is to conduct routine inspections of railroads. FRA also conducts system assessments where inspectors from all disciplines are brought together to conduct an assessment of all aspects of a railroad's operation. FRA inspectors also investigate accidents and complaints.

The regional offices are staffed with a director, safety specialists in each discipline, and inspectors. The safety specialists are responsible for assisting inspectors in planning and conducting inspection activities in their disciplines. When inspections or complaint investigations reveal noncompliance with the laws, inspectors are to list each noncomplying

condition (defect) in an inspection report. When the inspector identifies defects that pose an immediate safety hazard, he is to prepare a violation report that is submitted to FRA's Office of Chief Counsel. The Office of Chief Counsel is to process the violation and assess the railroad a civil penalty.

To inspect the nation's rail system, FRA had, as of December 1989, a total of 249 inspectors: 56 track, 86 equipment, 41 operating practices, 33 signal, and 33 hazardous materials. Its 249 inspectors and 58 supervisory personnel must inspect a rail system consisting of approximately 500 railroads, 20,000 locomotives, 1.2 million freight cars, and 258,000 miles of track. In addition, FRA has also relied on 110 state inspectors in 33 states to perform inspections for FRA under a cooperative agreement.

In 1989, FRA and state inspectors conducted 63,278 inspections and cited over 378,000 defects. FRA also conducted system assessments of the Montana Rail Link Railroad and the Oklahoma, Kansas and Texas Railroad in that year. In 1988, FRA and state inspectors conducted 65,309 inspections and cited over 360,000 safety defects. FRA also conducted two system assessments in 1988—one of the Guilford Transportation Industries and another on the New Jersey Transit Rail Operations.

## Prior Railroad Safety Reports

Three prior GAO reports noted problems with FRA's safety program. Our April 1989 report analyzed the accuracy of accident and injury data reported by railroads to FRA. We discovered problems with the accuracy of the data submitted by railroads and made recommendations that will improve the accuracy of reporting by railroads. FRA agreed with our recommendations and is taking actions to improve reporting that include conducting more records inspections and requiring railroads to set up internal controls for reporting.<sup>1</sup>

In our November 1989 report on hazardous materials transportation, we noted that FRA had an inadequate number of hazardous materials inspectors to ensure that railroads and shippers were complying with safety regulations.<sup>2</sup> Based on our report, the Secretary of Transportation reported an inadequate number of hazardous materials inspectors as a material weakness under the Federal Managers' Financial Integrity Act.

<sup>1</sup>Railroad Safety: FRA Needs to Correct Deficiencies in Reporting Injuries and Accidents (GAO/RCED-89-109, Apr. 5, 1989).

<sup>2</sup>Railroad Safety: DOT Should Better Manage Its Hazardous Materials Inspection Program (GAO/RCED-90-43, Nov. 17, 1989).

The Secretary reported that the insufficient number of inspectors prevents FRA from providing adequate coverage of hazardous materials shippers and railroads. Also in response to our recommendations, FRA has stated that it will hire more hazardous materials inspectors and rewrite its Hazardous Materials Enforcement Manual to revise its approach to shipper and carrier inspections.

In April 1990, we reported on FRA's inspection activities in one of its regional offices<sup>3</sup>. In that report, we concluded that the hazardous materials inspection program was hampered by the lack of written inspection goals and possibly by inadequate inspector resources.

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## Objectives, Scope, and Methodology

The Chairman, House Committee on Energy and Commerce, and the Chairman, Subcommittee on Oversight of Government Management, Senate Committee on Governmental Affairs stated that they were concerned about safety on the nation's freight and passenger railroads and requested that we assess the effectiveness of FRA's safety inspection program. Our overall objective was to assess the adequacy and efficiency of FRA's approach to safety inspection activities. More specifically, we determined whether FRA had coverage standards indicating how often railroads and equipment should be inspected, how FRA uses inspection data to target railroads for inspection, actions taken by railroads to correct identified safety defects, and whether inspectors were uniformly applying FRA's safety regulations when conducting inspections. Because of our November 1989 report on hazardous materials inspections, we did not include hazardous materials inspections in this report.

We conducted our review at FRA headquarters offices, and at four of its eight regional offices (Atlanta, Georgia; Chicago, Illinois; Fort Worth, Texas; and Portland, Oregon). We selected these four regions to provide a balance of regions with stable or rising accident rates and provide nationwide coverage. We also discussed FRA inspection activities with officials from the National Transportation Safety Board, the Association of American Railroads, the Soo Line Railroad, and state railroad officials for all 33 states participating in the FRA state inspection program. Appendix III contains a listing of the states that conduct FRA inspections.

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<sup>3</sup>Railroad Safety: More FRA Oversight Needed to Ensure Rail Safety in Region 2 (GAO/RCED-90-140, Apr. 27, 1990).

We reviewed federal laws and regulations on railroad safety, and FRA's General Manual and inspection manuals to determine FRA's inspection requirements, policies, and standards. We analyzed data on FRA inspection activities contained in the Railroad Inspection Reporting System (RIRS) database. Because of the importance of this automated system to our findings, we conducted a reliability assessment of the database at FRA's data entry contractor, I-NET in Bethesda, Maryland. We found the accuracy of the data to be high. The methodology and results of this assessment are contained in appendix I.

To assess the coverage and uniformity of FRA inspections, we interviewed regional safety directors, deputy regional directors, district chiefs, specialists, and inspectors. We discussed the same matters with the directors of the Office of Safety Analysis and the Office of Safety Enforcement and their staffs in headquarters. We analyzed RIRS data on individual inspectors and data on railroads provided by the Office of Safety Analysis.

To assess how FRA uses inspection data to target its inspection activities, we reviewed FRA's National Inspection Plans, and interviewed regional safety directors and specialists. We also interviewed and obtained data from headquarter's Office of Safety Analysis officials responsible for the plans.

To assess the efficiency of FRA's railroad system assessments, we reviewed the three assessments of Class I railroads conducted in 1987 and 1988. We compared the results of system assessment findings to routine inspection data in the RIRS. We also obtained data on the cost of system assessments from the Office of Safety Enforcement and interviewed FRA specialists and inspectors who took part in system assessments.

We conducted a telephone survey of the program directors for the 33 states who under a cooperative agreement with FRA conduct inspections for FRA to discuss their perceptions about the program and determine their future level of participation. We also discussed FRA-state coordination with FRA regional safety directors and safety specialists in each of the four regions visited.

We conducted our work from April 1989 to June 1990 in accordance with generally accepted government auditing standards. We discussed the factual information in this report with the FRA Administrator and other top level officials responsible for railroad safety. A discussion of

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their comments are contained in the body of the report. As requested, however, we did not obtain official agency written comments on the report draft.

# FRA's Inspection Program Not Effective

FRA's inspection program is not effective in ensuring that the nation's railroads are operating safely. FRA's inspection program does not (1) include inspection coverage standards prescribing how often railroads should be inspected; (2) target railroads for inspection on the basis of problems identified through analysis of existing accident, injury, and inspection data; and (3) require railroads to report actions taken to correct safety problems identified during FRA inspections. Because FRA's inspection program is ineffective, many railroads go uninspected. Also, FRA does not know if (1) its inspector workforce is sufficient to carry out its safety mission, (2) high-risk railroads are not targeted for inspection, and (3) safety problems identified during inspections are being corrected.

## FRA Has No Inspection Coverage Standards

FRA does not have minimum inspection coverage standards that prescribe (1) how often railroads should be inspected, (2) the size of an inspector's territory, (3) the number of inspection locations an inspector can reasonably cover, and (4) how often inspection locations should be covered. Neither do FRA policies and manuals set minimum standards describing adequate levels of inspection coverage. For example, there is no clear standard for how often a passenger or hazardous materials route should be inspected. FRA is in the process of collecting data on regional inspection points in an effort to determine the size of each inspector's territory and how often inspections are conducted in that territory. Because no coverage standards exist, individual inspectors decide what constitutes adequate coverage. Without coverage standards railroads go uninspected, and FRA cannot accurately determine how many inspectors it needs. Furthermore, it is uncertain whether FRA can continue to rely on assistance from state inspectors and how this might affect the number of inspectors FRA needs for proper coverage.

## Many Railroads Not Inspected

Our review of FRA inspection data showed that during 1989 some railroads received no inspection of any type. Because of the size and diversity of the railroad industry, it may not be possible for FRA to cover each railroad in all five inspection disciplines each year. Typically those railroads not inspected are the smaller, short-line railroads, but on occasion railroads with significant activity are also not inspected. The presence of short-line railroads, which have had consistently higher accident and injury rates than the industry as a whole is growing. The number of train miles of smaller railroads has increased 38 percent between 1985 and 1988. These railroads accounted for about 11 percent of the rail

activity in the United States. Many other railroads did not receive an inspection in one of the disciplines. For example, in 1989

- for railroads that operated at least 1,000 train miles, 32 did not receive an inspection of any type;
- operating practices inspections were not performed at 168 of the nation's 580 railroads;
- of 415 railroads owning track, 75 with a total of 1,164 miles of track did not receive a track inspection;
- of 484 railroads filing accident or incident reports, 265 were not inspected to verify the accuracy of their reporting; and
- the Alaska Railroad, a regional-sized railroad with over 316,000 passengers, 600 miles of track, and 1,300 cars and locomotives, did not receive a rail safety inspection of any type. Approximately 49 percent of this railroad's freight-ton miles<sup>1</sup> involve hazardous materials shipments.

FRA Office of Safety officials said that FRA inspectors could not adequately inspect the nation's entire rail system in a given year. Officials in each FRA region we visited told us that they could not adequately cover their assigned territories. Different FRA regions have different interpretations of what constitutes adequate inspection coverage. For example, one regional signal specialist defined adequate coverage as inspecting every signal at least once every 1 to 1-1/2 years, while a signal specialist in another region defined adequate coverage as inspecting every signal once every 2-1/2 years. Additionally, one regional equipment specialist defined adequate coverage as inspecting 50 percent of the cars operating in the region each year, while another regional equipment specialist defined adequate coverage as inspecting 20 percent of the cars operating in the region each year. Without coverage standards, inspectors and regions' judgments in deciding what constitutes adequate coverage can vary widely.

Vacancies in existing inspector positions have contributed to coverage problems. In some cases, inspector positions remained vacant for more than a year resulting in coverage reductions or no coverage for some locations. For example, one track inspector stated that, because of vacancies, he could only inspect mainline track once every 10 months, instead of twice a year, as he considered necessary. Because of vacancies, total FRA inspections, which numbered about 71,000 in 1986, dropped each successive year to about 63,300 in 1989. In an effort to solve this problem, FRA hired 35 new inspectors in 1989. However, until

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<sup>1</sup>A unit of measure which measures one ton of freight moving one mile.

FRA defines the level of coverage it wants in each discipline, it will have no basis for determining whether its inspection resources are adequate to provide that level of coverage.

**Continued State Participation Uncertain**

The Federal Railroad Safety Act of 1970, as amended, augmented the federal inspection force by allowing state inspectors meeting FRA certification standards to perform track, equipment, signal, and operating practices inspections, provided the state agreed to participate in a cooperative program with FRA by following FRA inspection procedures, filling out FRA inspection forms, and citing railroads for defects and violations. As of September 1989, 33 states employed 110 inspectors: 62 track, 35 equipment, 11 operating practices, and 2 signal. Data on inspections conducted by state inspectors is recorded in FRA's inspection data base.

FRA uses state inspectors to provide significant amounts of track and equipment inspection coverage. As shown in table 2.1, states inspected 45 percent of the approximately 400,000 miles of track inspected by FRA and state inspectors in 1988. States also inspected 33 percent of the approximately 1,146,000 cars inspected by FRA and state equipment inspectors. Because of the large number of inspections performed by state inspectors, 26 of the 33 state program directors stated that FRA could not adequately cover their states if the state programs did not exist.

**Table 2.1: FRA and State Track and Equipment Inspections, 1988**

FRA region	Miles		Cars	
	FRA	State	FRA	State
1	17,188	12,277	56,488	22,837
2	29,050	29,091	165,867	172,449
3	32,613	28,328	124,150	81,973
4	29,579	32,918	121,572	0
5	43,886	18,667	93,377	31,278
6	38,825	30,482	128,816	21,662
7	8,206	15,826	37,766	26,630
8	21,125	12,263	40,831	19,869
<b>Total</b>	<b>220,472</b>	<b>179,872</b>	<b>768,867</b>	<b>376,698</b>

Source: FRA Railroad Inspection Reporting System

Until fiscal year 1989, FRA paid a portion of each state inspector's salary. Since that time, FRA has not funded the state inspector program. As a result, several states altered their inspection programs or mentioned possible future changes. Ten state directors said that they



responded to the elimination of funding by increasing state-related inspection activities and decreasing FRA-related inspections. The potential exists for FRA's inspection program, particularly in track and equipment, to be seriously limited if states completely abandon their railroad inspection programs.

Many state directors we contacted complained about communication and coordination problems between FRA and their states. State program directors also said that coordination of inspection activities and communication between state and federal inspectors is poor. Fourteen of the 33 states we contacted characterized FRA's coordination of inspection activities with their states as poor or inadequate. Good communication is important because state and FRA inspectors may not have distinct, separate inspection territories. Poor communication causes inspectors to overlap inspection activities making the program less efficient. State directors, FRA inspectors, and railroad officials we talked to cited instances of state and FRA inspectors inspecting the same railroad location only days apart.

State directors do not expect that poor communication between federal and state inspectors will improve in the future. In fact, four state directors said that the relationship between federal and state inspector offices will deteriorate further given the elimination of federal funding.

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## Safety Data Not Used to Target Inspections

In our 1987 management review of DOT, we noted that FRA needs to develop safety indicators to effectively deploy its inspector resources.<sup>2</sup> One safety indicator is whether or not railroads are inspected. As noted earlier in this report, FRA does not have minimum coverage standards that has resulted in some railroads going uninspected, especially in certain disciplines. Another safety indicator is railroads with poor safety histories. FRA does not use available data to target routine inspections toward high-risk locations and railroads with poor safety histories making inspections less effective. FRA targets routine inspections poorly because FRA's Office of Safety sends regional offices accident data that safety specialists often do not analyze. Instead, the specialists rely on individual inspectors to independently schedule their own inspection activity.

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<sup>2</sup>Department of Transportation: Enhancing Policy and Program Effectiveness Through Improved Management (GAO/RCED-87-3S, Apr. 13, 1987).

Another safety indicator could be the volume of usage of track and equipment. FRA created the National Inspection Plan (NIP) in response to the Congress' directive in 1980 to submit a safety plan. As part of this plan, FRA was required to develop a methodology to determine the frequency and schedules of safety inspections, giving appropriate priority to track and equipment involved in passenger trains and hazardous cargos. The methodology was to also analyze and take into account the safety records of the railroads, location of track and equipment, and volume of usage of track and equipment. FRA has yet to develop such a methodology because it does not gather information on volume of traffic on individual passenger and hazardous materials routes.

Whether a railroad is experiencing a particular safety problem or problems could be another safety indicator and can be determined from an analysis of routine inspection data. FRA's approach to system assessments is inefficient because it does not use safety data from its routine inspections to target assessment activity to problem areas. Instead, FRA conducts hundreds—sometimes thousands—of additional routine inspections during system assessments.

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### Routine Inspections Not Targeted to High-Risk Railroads

Instead of using the safety data it collects to target its inspection efforts, FRA relies on its inspectors' personal judgment and knowledge to determine where inspections are needed. We found little relationship between changing accident trends and FRA inspection activity. As a result, railroads with increasing numbers of accidents did not receive additional inspection coverage.

Because of the dependence on individual inspectors, we found many instances in which FRA did not respond to an increase in accidents on a railroad by increasing inspections. In fact, in many cases inspections actually decreased, indicating a misallocation of inspection resources because the worsening level of safety on a railroad should require more, not less, inspection resources to determine the cause for the rise in accidents. For example, while the number of CSX accidents due to human error increased in Tennessee by nearly 67 percent between 1986 and 1988, FRA decreased operating practices inspections on the railroad by about 45 percent. At the same time in Tennessee, FRA increased operating practices inspections on the Norfolk Southern Railroad by 41 percent, even though Norfolk Southern reported only four accidents due to human error in 1986 through 1988. We found comparable examples at other railroads for other inspection disciplines.

FRA's current approach to routine inspections is primarily based on the inspector's knowledge of his territory. Regional specialists and district chiefs we interviewed emphasized that inspectors are in the best position to determine which railroads need inspecting because they are more familiar with increases and decreases in traffic on carriers throughout the year and know where the problems are in their territory. Thus, FRA relies on the inspectors' judgment to schedule their inspection activities. These schedules are rarely revised by regional or headquarter's officials.

FRA recently has experienced a significant turnover in inspectors, which affects the inspectors' overall level of experience and knowledge of their territories. In 1989, FRA hired 35 of its 249 inspectors. According to the Director of the Office of Safety Analysis, by the end of 1990 approximately half of FRA's inspectors will have been hired within the last 2 years. This condition raises serious questions about FRA's current non-systematic approach to inspection activity because much of the inspection workforce will not have FRA experience or specific knowledge of their territories.

FRA's Office of Safety Analysis does little analysis of its safety data to highlight problems or trends for the regional offices. Instead, regional offices receive a monthly, unanalyzed listing of all accidents which occurred in the region. Each discipline has a specialist who is responsible for analyzing this data and adjusting inspection efforts accordingly. Regional specialists we interviewed, however, did not systematically analyze this data and rarely changed inspection activity because of it.

FRA Office of Safety Analysis officials stated that FRA needs to improve its targeting of inspection resources based on an analysis of all available safety data. These officials explained that FRA currently does not have an effective methodology to consolidate safety data contained in several reporting systems because they were designed independently to address various safety and policy reporting requirements within FRA. They also stated that FRA needs to develop additional data on carriers' volume of traffic in specific inspector territories. With this data and the integration of existing data, these officials said that they could better target inspection resources.

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## NIP Does Not Prioritize High-Risk Routes

In response to the 1980 congressional directive to submit a safety plan, FRA developed the NIP. FRA also developed the Statistical Analysis Report (SAR) as one element of the NIP. The SAR shows the percentage of accidents each railroad in a region experienced during the previous 13 quarters. Each region receives a copy of the SAR to use in developing their portion of the NIP. The FRA official who created the SAR methodology in the early 1980s said that it was to be a starting point in complying with the congressional directive. We found that FRA has not improved the SAR methodology by collecting data it needs on passenger and hazardous materials movements in specific locations. As a result, FRA has yet to fully develop a methodology for scheduling inspections that incorporates data on track and equipment involved with passenger trains and hazardous cargos, volume of usage of track and equipment, and location of track and equipment in population centers as directed by the Congress.

FRA regional officials at the four regions we visited did not document or analyze inspection results on passenger and hazardous materials routes in preparing the NIP. Although officials in each region stated that such routes should be inspected twice a year, none of the four regions could provide us with the total amount of inspection coverage of these routes in 1988 nor the findings of those inspections. According to the regional safety specialists we interviewed, such information was not tracked or used in determining the number and types of inspections. Instead, inspectors were expected to know where such major routes were in their territories and provide them adequate coverage.

FRA does not target high-risk locations through the NIP. For example, one FRA region planned to decrease its track inspection coverage of the Union Pacific's track from 4,100 miles in 1988 to 2,880 in 1989 even though (1) the number of Union Pacific track-caused accidents in the region had nearly doubled between 1987 and 1988, (2) Union Pacific carries heavy hazardous materials traffic over more than 2,800 of its 6,158 miles of track in the region, and (3) Amtrak trains operate over 740 miles of Union Pacific track in the region.

In addition, the NIP currently does an inadequate job of targeting high-risk areas because FRA does not collect data on specific locations that carry a high volume of passenger and hazardous materials traffic. Rather, FRA depends on inspector knowledge of their territories to target high-risk locations. FRA Office of Safety officials stated that they plan to collect data within the next year that would enable them to target high-risk areas in the 1991 NIP.

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## NIP Not Used as an Effective Management Tool

FRA does not use the NIP as a management tool to effectively plan, monitor, execute, and evaluate FRA's inspection program. We noted this in our 1987 management review of DOT, and the same situation currently exists.

Regional plans receive a minimum amount of review by the Office of Safety and are not integrated to provide a national inspection approach. We found instances where regional submissions were identical to the previous year's submission and not changed by FRA headquarters. For example, one FRA region planned to inspect, for every railroad in the region, exactly the same number of cars, locomotives, and equipment records in 1989 as it planned to inspect in 1988. FRA Office of Safety officials responsible for developing the NIP estimated that regional submissions were changed approximately 10 percent of the time. They also acknowledged that the NIP needs greater national integration and that they are working toward that goal.

Planned system assessments are often not included in the NIP. According to FRA's Acting Director of the Office of Safety Enforcement, this occurs because FRA must respond to immediate safety problems and congressional concerns, and needs to reserve judgment on the selection of railroads for system assessments based on these factors. However, regional officials stated that if system assessments are not included in the NIP, the number of planned inspections is not representative of what may actually occur if a system assessment is conducted in that region. For example, in our analysis of FRA inspection data, we found that in 1987 one FRA region exceeded its planned car inspections of the Soo Line Railroad by nearly 70 percent because it conducted a major part of the Soo Line system assessment. In contrast, the same region inspected approximately 29 percent of the Union Pacific cars it had planned to inspect in that year, in part because of the number of inspections conducted during the Soo Line system assessment.

We also found that FRA regions and the Office of Safety did not monitor their performance against the plan for specific railroads. Instead, regional specialists tracked inspection totals for each discipline and relied on inspectors to ensure coverage of specific railroads. The Office of Safety tracked performance quarterly on the basis of total number of inspections and the average time taken to complete each inspection. Neither approach ensures that the inspections are adequately covering individual railroads because FRA regions do not know how often a specific railroad was covered in a given year relative to planned activity.

Finally, FRA does not assess each region's performance at the end of the year to determine if regional goals were met. FRA has not developed an evaluation mechanism to judge how actual inspection performance compares to planned performance. Our analysis of FRA inspection data showed that FRA regions often greatly exceeded or did not meet their planned inspection activity for specific railroads. For example, one FRA region exceeded the number of inspections of Burlington Northern's track records that it planned to inspect in 1988 by 413 percent. At the same time, it inspected only 12 percent of the records for Florida East Coast Railroad's track that it planned to inspect. Another FRA region planned to conduct 182 inspections of operating rules on the Burlington Northern in 1988 and 59 such inspections on the Southern Pacific Railroad. However, the region actually conducted twice as many inspections as planned for the Southern Pacific but only half as many as planned for the Burlington Northern.

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### FRA's Approach to System Assessments Not Efficient

During system assessments, FRA often finds problems with a railroad's operation that it could have identified if it had analyzed existing data from its routine inspections. Our analysis shows that, had FRA analyzed existing inspection data for each of the railroads involved in the most recent system assessments, it would have realized that it had already identified safety problems and could have eliminated the expenditure of a tremendous amount of resources. By analyzing existing inspection data, FRA could have focused its attention during the system assessment on finding causes of the safety problems that were already identified. We reviewed the three most recent system assessments conducted on Class I railroads that were issued by the time of our review: the Soo Line (1987), Conrail (1987), and Guilford Transportation Industries (1988). Examples of what we found in the three inspection disciplines of operating practices, track, and signal follow:

- During the Conrail system assessment, about 14 percent of all operating practices defects involved failure to report accidents. Inspection data prior to the assessment, however, shows that FRA had already discovered the problem and should have been looking for the cause of the problem. In both 1986 and prior to the assessment in 1987, FRA cited Conrail for failure to report accidents at a rate over double the national average for 1986 and 1987.
- During the Soo Line assessment, about 12 percent of all track defects involved defective rails. Inspection data prior to the assessment reveals that in 1986, about 11 percent of all Soo Line track defects involved defective rails—higher than the national average of about 7 percent.

Prior to the assessment in 1987, nearly 10 percent of all Soo Line track defects concerned defective rails, while the national average was approximately 7 percent.

- During the Guilford assessment, about 24 percent of all signal defects concerned signal wires on pole lines and cables. Inspection data prior to the assessment reveals that in 1987, about 36 percent of all Guilford signal defects involved wires on pole lines and cables — more than three times the 1987 national average of about 12 percent. In 1986, 16 percent of all Guilford signal defects involved pole lines and cables, which exceeded the national average of 12 percent in that year. If FRA had analyzed prior inspection data for Guilford, it would have discovered the problem earlier and could have brought it to Guilford's attention.

FRA's inspection force consists of about 300 inspectors and specialists, and system assessments require a large number of these resources. Recognizing this in 1986, FRA requested five new deputy regional director positions to handle the increased work load caused by system assessments. Table 2.2 shows the level of resources used for the three assessments of Class I railroads we reviewed.

**Table 2.2: FRA Resources Used to Complete System Assessment Field Work**

Dollars in thousands			
Railroad	Inspections involved	Inspections performed	Cost
Conrail	80	4,152	\$1,277
Guilford	40	771	214
Soo Line	62	652	194

Source: FRA Office of Safety Enforcement.

Several FRA regional officials and inspectors we interviewed were critical of how system assessments are currently conducted and of the resources involved. One specialist who participated in the Conrail system assessment commented that the assessments direct valuable inspector resources away from routine inspections and are not highly productive. He added that it would be more beneficial for FRA to analyze current inspection data to identify problem areas on particular railroads rather than to exert such a large effort reviewing the entire operations of a railroad. One acting regional director believed that system assessments were too large, involved inspectors from too many regions, and covered disciplines that may not be problem areas.

Because current system assessments are labor intensive and FRA does not use inspection data in planning and conducting these assessments,

we believe FRA is not efficiently using its inspection resources. By systematically planning and conducting system assessments using the data it has, FRA could conduct more system assessments and better investigate problem areas to bring to the attention of top railroad management.

Follow-up on system assessments has not been timely. The Department of Transportation (DOT) Inspector General (IG) in 1984 recommended that FRA establish formal guidelines for system assessment follow-up. The IG noted that follow-up reviews were the key to the effectiveness of system assessments. In response, FRA issued assessment guidelines, which state that follow-up activity must begin 8 to 10 weeks after FRA receives the railroad's response.

We analyzed the system assessments conducted since the 1985 guidance was issued to determine whether follow-up reviews were conducted in accordance with the guidance. We found that only two of the eight follow-up reviews met FRA's criteria. The six follow-up reviews that did not meet FRA's criteria experienced delays of at least 6 months.

**Table 2.3: Time Between Railroad Written Response and FRA Follow-Up Review**

Railroad	Elapsed time	Met FRA follow-up criteria?
1. Burlington Northern	4 weeks	Yes
2. SEPTA	10 weeks	Yes
3. Metro North	40 weeks	No
4. Norfolk & Western	60 weeks	No
5. Conrail	76 weeks	No
6. Guilford	36 weeks	No
7. New Jersey Transit	48 weeks	No
8. Soo Line	52 weeks	No

Source: FRA Office of Safety Enforcement

## Ineffective Follow-Up and Reinspection

FRA has no assurance that railroads are correcting problems identified in its routine inspections because there are no requirements that the railroads respond in writing to indicate that an identified defect has been repaired. Even in the absence of requirements to report corrective actions, railroads voluntarily respond in writing to most track and signal defects indicating that corrective actions have been taken. Although some railroads also report corrective actions for equipment and operating practice defects, FRA maintains no record of these written responses. In addition, FRA does not perform many reinspections, an additional tool for verifying whether a safety defect has been corrected.



As a result, FRA cannot be certain that the railroads have corrected the safety defects it has identified.

For track and signal defects, railroads generally respond in writing to FRA indicating that the identified safety problem has been corrected. However, given the large number of track and signal defects found during inspections, thousands of them had no written response to FRA. In 1986 through 1988, FRA identified about 361,000 track defects for which nearly 40,000, or 11 percent, had no recorded railroad response as shown in table 2.4. Furthermore, of the 88,000 track defects identified as serious enough to warrant a \$5,000 civil penalty, 11 percent had no recorded response. Additionally, 46 percent of the signal defects with associated civil penalties of at least \$5,000 did not have a recorded response.

**Table 2.4: Total Track and Signal Defects and Violation Reports as Compared to Defect and Violation Reports With No Follow-Up, 1986-88**

	Track 1986-88		Percent non-response
	Total	No railroad response	
<b>Total Defects</b>	<b>360,683</b>	<b>39,964</b>	<b>11.1</b>
Defects with \$5,000 Penalty	88,401	9,534	10.8
Violation Reports	769	128	16.6
	Signal 1986-88		Percent non-response
	Total	No railroad response	
<b>Total Defects</b>	<b>34,813</b>	<b>5,039</b>	<b>14.5</b>
Defects with \$5,000 Penalty	219	101	46.1
Violation Reports	428	76	17.8

Source: FRA Railroad Inspection Reporting System

Reinspections are a tool for determining whether a safety problem has been corrected. In a limited number of cases where FRA inspectors performed a reinspection, we found many instances in which the reinspection revealed that previously cited defects had not been corrected by the railroad. Not correcting identified safety defects is one of the factors FRA inspectors use in deciding whether a defect should be cited as a violation and a civil penalty assessed. Because of limited reinspections and the absence of a requirement that railroads respond in writing indicating defects have been corrected, FRA has little assurance that railroads are actually correcting defects.

In 1988, FRA conducted 57,435 track, equipment, signal, and operating practices inspections of which 1,527, or 2.7 percent were reinspections.

Only one of FRA's five disciplines, signal, has an established standard indicating when an inspector should conduct a reinspection. In that discipline, however, only 125 of the 5,699 inspections conducted in 1988, about 2 percent, were reinspections.

We found several instances in which an FRA reinspection revealed that previously cited serious safety defects had not been corrected by the railroad. For example, one FRA track inspector found numerous defects during an initial inspection of a high density hazardous materials route near a populated area. During a subsequent reinspection, the inspector found that the railroad had failed to correct several of the defects. According to the inspector, any one of these conditions could have led to a catastrophic accident. As a result of the reinspection, the inspector cited the railroad for violations in each case.

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## Conclusions

We found major problems with the way FRA was implementing its rail safety inspection program. FRA has not established minimum inspection coverage standards or standards for the size of an inspector's territory or how much an inspector could be expected to inspect. These standards are needed to determine the size of the inspector workforce. FRA also relies on state inspectors to provide inspection coverage, but poor communication and coordination have caused problems. In addition, the continuation of the state program is in question due to the elimination of federal funding.

FRA does not take a systematic approach to both its routine inspections and system assessment activities by using available safety inspection data. FRA has not fully integrated available inspection, accident, and injury data to target high-risk locations for routine inspections in order to achieve the maximum effectiveness from its limited inspection resources. FRA's reliance on inspector judgment and knowledge to execute its inspection program has resulted in high-risk areas receiving decreased inspection activity. In addition, FRA has not used the NIP as a management tool to assess the effectiveness of its program, and the NIP does not meet a congressional directive that FRA develop a methodology to prioritize its inspection activity to high volume passenger and hazardous materials routes. FRA does not use its safety data to efficiently use inspection resources during system assessments. FRA has not followed up on its system assessment findings in a timely manner, which further reduces their effectiveness.

FRA has no requirements that railroads respond to FRA by sending notification of actions taken to correct safety defects that were identified during routine safety inspections. Thus, FRA has no assurance that the railroads are correcting unsafe conditions. In addition, a possible tool to determine if railroads are correcting safety defects—reinspections—is seldom used.

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## Recommendations

In order to make FRA's railroad safety inspection program more effective in ensuring that the nation's railroads are operating safely, we recommend that the Secretary of Transportation direct the Administrator, FRA to take the following steps:

- Establish a minimum inspection coverage standard for each of its inspection disciplines and determine the number of inspectors necessary to achieve this standard of coverage. In determining the number of inspectors needed, FRA needs to determine the projected size of the state inspector workforce and include this in its coverage analysis.
- Resolve communication and coordination problems with the states by routinely exchanging inspection plans and periodically meeting with state directors and inspectors to discuss their inspection activities.
- Improve its National Inspection Plan by developing a methodology that incorporates past inspection results and prioritizes inspections on the volume of traffic on passenger and hazardous materials routes.
- Use its safety data to target high-risk railroads and locations for routine inspections.
- Redefine the approach to system assessments by using existing inspection data to detect known areas of weakness and assign inspector resources to determine the underlying causes of these weaknesses.
- Complete system assessment follow-up reviews within the timeframes established by FRA criteria.
- Establish an effective follow-up program that would include (1) requiring railroads to report actions taken on FRA inspection findings, (2) determining what reinspection levels are needed to ensure railroads are responding to inspection findings, and (3) attaching civil penalties for failure to report corrective actions.

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## Views of Agency Officials

We discussed the facts in this report with the Administrator, FRA, and top level safety officials who generally agreed with our findings, especially the need to change the inspection program. Specific comments on the topics covered in this chapter follow.

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### Need for Inspection Coverage Standards

The Administrator stated that, from his perspective, the current inspection approach is too random and that inspection coverage standards are needed. He added that FRA is trying to hire new inspectors to reach their authorized ceiling of 361 inspectors. The Administrator also said that he is in the process of hiring a new Director of Training and Communication to train entry-level employees in a comprehensive 2-week orientation program. The new director will also be responsible for designing a new training program for regional directors and inspectors that would include training on how to analyze and interpret data needed to establish inspections coverage standards.

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### Targeting Inspections

The Administrator agreed with our finding by saying that FRA needs to take the randomness out of its inspection strategy. He stated that what FRA needs is a more scientific and strategic approach to inspections based on the information currently available. He added that inspectors need to be computer literate and schooled in analytical techniques so they can recognize trends in safety data and react accordingly.

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### Inspection Follow-Up

The Administrator stated that we should not be advocating a 100-percent reinspection effort because it is not feasible given current staff. FRA safety officials stated that requiring railroads to report their corrective actions on equipment defects and reinspecting them is not feasible because equipment is moved on a day-to-day basis. These officials added that requiring railroads to report their corrective actions may pose an undue paperwork burden on the railroads. FRA's Office of Chief Counsel officials stated that reinspections are not needed because inspectors monitor defect ratios to determine compliance and that the enforcement program also ensures compliance.

We are not advocating 100-percent reinspection, but a process through which railroads submit reports to FRA indicating that defects have been corrected. As it is now, FRA does not know whether railroads are correcting the defects found by FRA inspectors. Furthermore, a sampling procedure could be designed for follow-up to determine whether corrective actions have been taken.

# FRA Inspectors Do Not Uniformly Apply Safety Standards

The Federal Railroad Safety Act of 1970, as amended, states that federal rail safety laws and regulations “shall be nationally uniform to the extent practicable.” FRA’s stated policy is that uniform application of the act is essential for effective program management. We found that FRA and state inspectors did not apply safety rules and standards uniformly throughout the railroad industry. Our analysis of inspection activities between 1986 and 1988 showed that uniform application was not achieved because of outdated or minimal written guidance, limited training, and minimal coordination among safety specialists. This has resulted in FRA regions filing different numbers of violations against railroads for the same defective safety conditions.

## Regional Differences Exist in Enforcement

Uniformity in enforcement of rail safety regulations does not exist between FRA’s eight regional offices. Our review of FRA inspection data between 1986 and 1988 revealed numerous examples of one FRA region filing many more violations than another—often concerning the same defective condition. For example:

- In 1988, one FRA region cited railroads for inadequate track inspection records 312 times but filed no violation reports. Another FRA region found the same problem 433 times in that year and cited it as a violation in 165 of those cases.
- In 1988, one FRA region cited improperly secured center plates—a serious equipment defect with a \$5,000 civil penalty—72 times but filed only one violation. Another FRA region found this serious defect 45 times in 1988 but cited it as a violation in 16 cases.
- In 1987, one FRA region cited signal defects for “shunting sensitivity”—a serious signal defect with a \$5,000 civil penalty—13 times with no violations. Another FRA region, however, found this same serious defect eight times and cited it as a violation all eight times.

Several FRA headquarters officials, regional specialists, and inspectors expressed concern about the level of uniformity between FRA regions. In one case, an equipment specialist we interviewed complained about the number of defective cars and locomotives entering his region from another region. He said that this occurs because his inspectors were much more aggressive in enforcing regulations than the other region’s inspectors, noting that his region wrote many more equipment violations.

## Causes of Lack of Uniformity

FRA does not achieve uniform application of rail safety regulations because agency enforcement manuals are outdated or provide minimal guidance as to when violations should be written, training is limited, and there is minimal coordination among safety specialists to ensure a common approach among inspectors.

Written guidance provided to inspectors is generally outdated and provides vague criteria as to when a violation should be written. Only one enforcement manual has been updated and issued within the last 7 years. For example, FRA's equipment manual dates back to 1975 and the operating practices and hazardous materials manuals date to 1983. The track enforcement manual was updated in 1987 and FRA's general policy manual has recently been updated but has not yet been issued to inspectors. FRA officials agreed that the manuals were outdated and stated that they are in the process of hiring a new Director of Training and Communication who will be responsible for, among other things, keeping the manuals current.

In addition, these manuals only outline general factors, such as the seriousness of the defect and the compliance history of that railroad, which the inspector should consider in making his decision to issue a violation. Each inspector is expected to use his own judgment in deciding when a violation should be cited using FRA's safety manuals and his experience as guides. As a result, one inspector may cite a serious defective condition but not file a violation report while another may find the same serious condition and file a violation report.

We found in each inspection discipline that FRA has inspectors who did not file a single violation against any railroad over a 3-year period. In addition, we found that numerous inspectors filed one to three violation reports—one per year or less—during the same 3-year period. We also found a number of inspectors who filed many violation reports while conducting approximately the same number of inspections as those inspectors who filed almost no violation reports. For example, of the 105 track inspectors who performed at least 300 inspections during 1986-88,

- 16 filed no violation reports,
- 39 filed one to three violation reports, and
- 9 filed more than 20 violation reports.

We found similar disparities with equipment inspectors. For example, one FRA equipment inspector filed violation reports in 37 percent of his 413 inspections during 1986-1988, while another FRA equipment

inspector filed no violations as a result of his 465 inspections. Table 3.1 provides a breakdown of violation reports written by FRA and state inspectors by discipline for inspectors who conducted at least 300 inspections during 1986-88.

**Table 3.1: Enforcement Actions by  
 Inspector Discipline, 1986-88**

Violation reports	Number of Inspectors				Total
	Track	Equipment	Signal	Operating practices	
0	16	4	1	5	<b>26</b>
1-3	39	7	4	5	<b>55</b>
4-10	29	7	11	10	<b>57</b>
11-20	12	13	8	6	<b>39</b>
21-30	6	17	4	10	<b>37</b>
31-40	1	14	0	6	<b>21</b>
41-50	2	9	1	2	<b>14</b>
Over 50	0	46	0	2	<b>48</b>
<b>Total</b>	<b>105</b>	<b>117</b>	<b>29</b>	<b>46</b>	<b>297</b>

Source: FRA Railroad Inspection Reporting System

This lack of uniformity also exists between FRA inspectors in the same region and discipline. For example, between 1984 and October 1988, an FRA equipment inspector in one region made 759 inspections involving 1,738 locomotives and found 109 violations. Another equipment inspector in the same region made 778 inspections involving 1,750 locomotives and filed one violation.

FRA depends on inspectors to make decisions as to when a violation should be cited but provides them with limited training in the enforcement of federal safety regulations. For example, we found that of the approximately 300 FRA regional personnel, 147 had received one or no FRA training classes between 1985 and September 1989. In fact, 50 track inspectors hired by FRA prior to 1985 had received no FRA training between 1985 and September 1989. According to specialists and inspectors we interviewed, the level of their training was inadequate to ensure uniform application of the rail safety regulations. FRA headquarters officials concurred that such training had been inadequate. In addition, because of recent inspector turnover, FRA has a large number of new inspectors who have little experience in enforcing federal safety regulations, which could exacerbate the problems we identified.

Coordination between FRA safety specialists to ensure the uniform application of safety standards is also lacking. According to regional directors and specialists we interviewed, FRA should periodically hold meetings with all the safety specialists in each discipline to ensure a uniform enforcement approach. One track specialist stated, for example, that all eight track specialists had only met once in the last 6 years. Instead of such specialist meetings, FRA currently holds safety conferences involving field staff from one or two regions. According to FRA regional officials and inspectors, these conferences sometimes provide verbal guidance on FRA enforcement. However, FRA has no assurance that such verbal guidance guarantees national uniformity since it is provided to only a few regions at a time and is not in writing.

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## Conclusions

FRA inspectors have not uniformly applied safety regulations throughout the railroad industry. Inspectors in some FRA regions often cited serious safety problems as violations while inspectors in other regions rarely cited violations for the exact same safety problem. We believe that FRA has not provided adequate guidance or training to its inspectors to ensure the uniform application of the regulations as required by law.

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## Recommendations

In order for FRA to assure better uniformity of inspections, we recommend that the Secretary of Transportation direct the Administrator, FRA, to increase training, especially for new inspectors, and to issue formal guidance to inspectors reemphasizing the need for uniformity in citing violations.

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## Views of Agency Officials

The Administrator, FRA, agreed that inspectors are not uniformly applying the safety regulations and that there is a wide variance. He recognized that inspectors will vary because each may interpret the regulations differently, but his goal is to lessen the range of variance. To do this he is considering the following actions:

- Common training for all regional directors and deputies in Washington on how to apply the regulations.
- Common training for all specialists in each discipline.
- More regional conferences to disseminate information.
- Updated manuals by the new Director of Training and Communication.
- Frequent meetings between regional directors and the railroads in their region to discuss safety problems and enforcement actions.



# Reliability Assessment of FRA Inspection Data

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## Overall Assessment

Many of the analyses contained in this report rely on data contained in FRA's automated Railroad Inspection Reporting System (RIRS). Because we relied on this data, we conducted a limited reliability assessment of the RIRS as required by Government Auditing Standards. We found the accuracy of the data to be sufficiently high to be usable in performing the analyses contained in this report—analyses not normally performed by FRA in managing its inspection program.

Although the data are not independently verified, we observed a variety of controls for detecting and correcting errors throughout the data entry process. The data entry contractor uses edit, logic check, quality control, review, and correction controls to ensure correct data. However, because 100 percent of the data are not independently verified by different data entry clerks, some portion of typing errors will not be detected and corrected by the controls in place.

To test the reliability of the specific data used in this report, we selected a sample of data elements, comparing data in the automated system with original paper inspection reports. Based on this sample, and the statistical analyses performed, we concluded that the overall accuracy of the data elements in the fields we reviewed is quite high.

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## System Overview

FRA employs a contractor I-NET—located in Rockville, Maryland, for entering data into the Railroad Inspection Reporting System. I-NET performs data entry on a multi-user system utilizing microcomputers.

I-NET inputs data to disk from batched inspection forms. On a weekly basis, data which have passed through I-NET's internal controls are written to tape and sent to the National Institutes of Health's computer system for inclusion in FRA's inspection database.

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## Data Receipt and Input

I-NET staff count and sort inspection report forms by form type, region, payroll ID, and report number, and record them in a daily receipts log. They visually scan documents for completeness, illegible information, and duplicate report numbers. If the form is incomplete or in error, I-NET staff either return the form to the inspector or contact the inspector by telephone for correction. After batching the forms by type of inspection, the batches are entered into the computer by data entry clerks.

## Quality Control Edits

I-NET uses various types of automated edit routines to flag incorrect data. These edits fall into two basic types: real-time edits during data entry, and batch edits done some time after the data are entered. Real-time edits include field edits that allow only valid codes or values to be entered into a field. Batch edits include special programs that are run to test data that have been entered into the computer. We observed 23 weekly batch programs for detecting discrepancies, missing data, or duplicative data.

## Results of Reliability Test

Because FRA does not retain original copies of inspection reports for more than one year, our review was limited to inspection reports for the January 1989 to August 1989 period. We selected a cluster sample of 75 inspections from each of four files in FRA's inspection database: signal, track, equipment, and operating practices. For each inspection selected, we traced the automated database information to the corresponding hardcopy source report to determine whether the inspection information had been accurately recorded. Our review included data from the header information for each record, as well as the detailed information on safety defects listed on the report. A single header record could be associated with multiple detail records identifying the defects cited on the inspection report. When an inspection had more than one detail record, we verified the information for all the detail records. The number of fields on the header and detail records we reviewed are shown in table I.1.

**Table I.1: Number of Record Header Fields and Detail Fields Reviewed**

File	Number of Fields Reviewed on	
	Header Record	Detail Records
Signal	13	3
Track	13	3
Equipment	8	4
Operating practices	23	3

Based on the number of errors found on the header and detail records, we determined an upper bound, lower bound, and best estimate of the accuracy of the data in the Railroad Inspection Reporting System. Results of this analysis, shown in table I.2, indicated a high level of data accuracy.

**Appendix I  
Reliability Assessment of FRA  
Inspection Data**

**Table I.2: Estimated Error Bounds by  
RIRS Data File**

Figures in percent

	<b>Estimated Data elements with wrong information</b>				
	<b>Elements reviewed</b>	<b>Errors found</b>	<b>Best estimate</b>	<b>Lower bound</b>	<b>Upper bound</b>
Signal	1,518	0	0.0	0.0	0.2
Track	3,654	2	0.1	<0.1	0.2
Equipment	3,840	5	0.1	<0.1	0.3
Operating practices	2,028	2	0.1	<0.1	0.4

Note: Estimated lower and upper bounds are at the 95-percent confidence interval. That is, if we had checked all the data elements in the selected fields and calculated the percent of incorrect data elements, 95 times out of 100 this percent would lie between the upper and lower bounds given. We used a cluster sampling design in which we randomly selected an inspection report, then verified all the selected data elements in the header and detail records for that report. However, results from formulas normally used with cluster sampling gave unrealistic results (lower bounds less than zero, for example). Therefore we based our estimates on the hypergeometric distribution, which may somewhat misstate the upper bound. Estimates based on the hypergeometric distribution assume that the data elements selected for review represent a simple random sample.

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# States Participating in FRA Inspection Program

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Alabama	Nevada
Arizona	New Hampshire
Arkansas	New Jersey
California	New York
Connecticut	North Carolina
Florida	Ohio
Illinois	Oklahoma
Iowa	Oregon
Kansas	Pennsylvania
Louisiana	South Carolina
Maine	Tennessee
Maryland	Texas
Michigan	Utah
Minnesota	Virginia
Missouri	Washington
Montana	West Virginia
Nebraska	

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**First-Class Mail  
Postage & Fees Paid  
GAO  
Permit No. G100**

**Official Business  
Penalty for Private Use \$300**

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