United States Government Accountability Office

Report to Congressional Requesters

December 2013

RAIL SAFETY

Improved Human Capital Planning Could Address Emerging Safety Oversight Challenges

GAO-14-85

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GAO Highlights

Highlights of GAO-14-85, a report to congressional requesters

Why GAO Did This Study

Railroad accidents pose significant safety risks to railroads, their employees, passengers, and the public. FRA oversees safety of the nation's railroads. In light of three high profile accidents in 2012 involving fatalities or hazardous materials, GAO was asked to review FRA's oversight processes and the challenges to railroad safety. This report examines (1) the overall framework that FRA, the states, and the railroads use to ensure rail safety; (2) the extent to which FRA and the railroads assess safety risks and allocate resources to address those risks; and (3) what challenges, if any, exist to FRA's current safety framework, and what ongoing and emerging issues FRA faces. GAO analyzed FRA accident and incident data, reviewed the analytical models FRA uses to incorporate risk into its inspection program, and interviewed FRA headquarters and field safety staff, officials from the 7 largest freight railroads and 11 smaller railroads, industry associations and 7 rail labor organizations.

What GAO Recommends

GAO recommends that FRA develop (1) a plan for finalizing its rulemaking and interim steps to implement its oversight of safety risk reduction programs, and (2) a strategic human capital plan that identifies and prioritizes FRA's human capital needs, links them to FRA's strategic goals and objectives, and includes approaches for how FRA will recruit, train, and retain inspectors and its new workforce of PTC and safety risk management specialists. DOT agreed to consider the recommendations and provided technical and other comments, which were incorporated as appropriate.

View GAO-14-85. For more information, contact Susan Fleming at (202) 512-2834 or flemings@gao.gov.

What GAO Found

The Federal Railroad Administration's (FRA) rail-safety oversight framework relies on inspections to ensure railroads comply with federal safety regulations. FRA inspects railroad infrastructure and operations, identifies safety defects, and may, if warranted, cite the railroads for violations of federal safety regulations. The agency estimates that its inspectors have the ability to annually inspect less than 1 percent of the railroad activities covered in regulation. As a result, railroads have the primary responsibility for safety of the railroad system. To formulate regulations, FRA instituted the Railroad Safety Advisory Committee, a forum for FRA, the railroads, rail labor organizations, and other stakeholders to arrive at a consensus on proposed rules. Thirty states partner with FRA in providing FRA-certified railroad safety inspectors who are also authorized to enforce federal safety regulations. Finally, many railroads have additional safety programs, rules, and technologies to ensure safety beyond the required federal standards.

FRA has developed a risk-based approach to direct its inspection efforts, but the agency has been slow to implement broader risk reduction planning. FRA has two tools to help direct its inspection efforts—the National Inspection Plan (NIP) and the Staffing Allocation Model (SAM). The NIP process uses past accident and other data to target FRA's inspection activities, and the SAM estimates the best allocation of the different types of inspectors across FRA regions in order to minimize damage and casualties from rail accidents. However, all eight FRA regional administrators expressed concerns about FRA's staffing process that relies primarily on the SAM to predict appropriate regional inspector needs, and that does not allow the flexibility needed to accommodate the regions' changing resource needs. In addition, the Railroad Safety Improvement Act of 2008 mandated safety risk reduction plans primarily for large freight and passenger railroads. FRA has not yet issued the final rule directing railroads to develop the plans, which was mandated to be issued by October 2012. According to FRA, the rulemaking was delayed due to concerns by railroads over their potential liability. Although FRA anticipates completing approval of railroad's plans by 2016, the agency has not developed an interim plan with specific timeframes to ensure that there are no further delays in issuing regulations and that timely evaluation and approval of the railroads' risk reduction plans occurs.

FRA faces several rail safety challenges, including how it will: (1) implement its oversight of positive train control (PTC), a technology designed to prevent certain types of rail accidents caused by human factors, and risk reduction plans; (2) adjust to changing rail traffic flows; and (3) ensure it has enough inspectors for its current and future oversight workload, as FRA expects 30 percent of field safety staff will be eligible to retire in 5 years. While FRA has long-term rail safety goals, its ability to meet those goals and respond to challenges is hampered by its lack of a strategic human capital plan. FRA officials stated that due to uncertainties about their budget, PTC implementation, and risk reduction plans, they plan for human capital needs in their annual budget request, rather than through a strategic human capital plan. However, without a plan, FRA may not make well-informed decisions about its workforce needs including having inspectors with the right skills for its current oversight activities and enough specialists to oversee the rail industry's implementation of PTC and safety risk reduction plans.

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Abbreviations

AAR	Association of American Railroads
ASLRRA	American Short Line and Regional Railroad Association
C3RS	Confidential Close Call Reporting System
DOT	Department of Transportation
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTE	full-time equivalent
NIP	National Inspection Plan
PHMSA	Pipeline and Hazardous Materials Safety Administration
PTC	Positive Train Control
RAIRS	Railroad Accident and Incident Reporting System
RRP	Risk Reduction Program
RSAC	Railroad Safety Advisory Committee
RSIA	Rail Safety Improvement Act of 2008
SAM	Staffing Allocation Model
SMS	Safety Management Systems
SOFA	Switching Operations Fatality Analysis
SSP	System Safety Plan
TTC	Transportation Technology Center

U.S. GOVERNMENT ACCOUNTABILITY OFFICE
441 G St. N.W.
Washington, DC 20548

December 9, 2013

The Honorable John D. Rockefeller IV
Chairman
Committee on Commerce, Science, and Transportation
United States Senate

The Honorable Richard Durbin
United States Senate

Railroad accidents pose significant safety risk to railroads, their employees, passengers, and the public. In July 2013, approximately 20 miles from the United States border in Lac-Mégantic, Canada, a runaway freight train derailed and exploded, killing 47 people and destroying the center of the town. This and other recent accidents demonstrate the type of destruction that train accidents can cause. The safety record of the railroad industry in the United States has shown marked improvement in the last 20 years, and according to Federal Railroad Administration (FRA) data, 2012 was the safest year on record; nonetheless, recent train accidents continue to underscore the need for vigilance. FRA provides regulatory oversight of the safety of about 780 United States railroads operating on about 200,000 miles of track, including both the issuing and enforcing of safety regulations.

The most recent authorization of FRA's rail safety activities occurred in 2008 through the Rail Safety Improvement Act of 2008 (RSIA).[1] FRA is responsible for implementing certain provisions of RSIA, which was due to be reauthorized at the end of fiscal year 2013.[2] RSIA gave FRA new responsibilities, including the oversight of the implementation of positive train control (PTC)[3] and railroad safety risk reduction programs. Since the

[1]Pub. L. No. 110-432, div. A, 122 Stat. 4848 (Oct. 16, 2008).

[2]As of December 6, 2013, the RSIA had not been reauthorized.

[3]PTC is a system of integrated technologies capable of preventing collisions, over-speed derailments and unintended train movements. Although railroads are developing and implementing slightly different PTC systems, such systems require active train location detection and tracking capabilities, computer networking technologies, software that accurately calculates braking distances for different types of trains, and a reliable wireless communication network to link all of these operating elements and system components.

enactment of RSIA, FRA has had to manage these new responsibilities, in addition to its regular oversight activities, in an increasingly austere budget environment.

In light of the three high-profile rail accidents in 2012 including fatal accidents in Maryland and Illinois, and a hazardous materials accident involving an explosion and fire in Ohio, you asked us to review FRA's railroad safety oversight and emerging rail-safety issues. This report discusses (1) the overall framework that FRA, the states, and the railroads use to ensure safety of rail operations and infrastructure, (2) the extent that FRA and the railroads assess safety risks and allocate resources to address those risks, and (3) the challenges to the framework and the ongoing and emerging issues FRA faces in railroad-safety oversight.

To determine the overall railroad-safety framework that FRA, the states, and the railroads use to ensure the safety of railroad operations and infrastructure, we examined applicable laws and regulations, FRA guidance, and other documentation, including reports describing the oversight mechanisms that FRA uses to ensure railroad safety.[4] We interviewed FRA headquarters and regional officials, state railroad-safety program officials and railroad officials to understand railroad safety programs, how inspections are conducted, and the extent to which federal, state, and industry representatives coordinate with each other to oversee railroad safety. We conducted site visits to three of FRA's eight regions: Atlanta, Georgia (Region 3); Chicago, Illinois (Region 4); and Fort Worth, Texas (Region 5). These three regions together accounted for over 50 percent of all train accidents that occurred from 2003 through 2012. We selected these regions using criteria which included the number

[4]GAO, *Rail Safety: The Federal Railroad Administration Is Taking Steps to Better Target Its Oversight, but Assessment of Results Is Needed to Determine Impact*, GAO-07-149 (Washington, D.C.: Jan. 26, 2007); *Rail Safety: The Federal Railroad Administration Is Better Targeting Its Oversight, but Needs to Assess the Impact of Its Efforts*, GAO-07-390 (Washington, D.C.: Jan. 30, 2007); *Rail Safety: The Federal Railroad Administration Is Better Targeting Safety Risks, but Needs to Assess Results to Determine the Impact of Its Efforts*, GAO-07-841T (Washington, D.C.: May 22, 2007); *Rail Safety: Preliminary Observations on Federal Rail Safety Oversight and Positive Train Control Implementation*, GAO-13-679T (Washington, D.C.: June 19, 2013), and DOT, *Office of Inspector General Audit Report: FRA Is Nearing Completion of Rules Required by the Rail Safety Improvement Act, but Needs to Improve Oversight*, CR-2013-070 (Apr. 17, 2013).

and mix of Class I, II, and III railroads[5] operating in the region, the highest number of reportable train accidents during the last 10 years by region including highway-rail grade crossing accidents, as determined by our analyses of FRA accident data, and the extent to which state safety inspectors operated in the region. We also selected a non-probability sample of 11 Class II and Class III railroads in four FRA regions to obtain their perspectives about federal and state railroad safety oversight. We selected railroads in these four regions (Regions 1, 3, 4, and 5) because they had the highest number of train accidents based on our analysis of FRA accident data. Our findings from our interviews in selected FRA regions, states, and railroads are not generalizable to all FRA regions, participating states,[6] or across all Class II and III railroads.

To determine the extent to which FRA and the railroads assess safety risks and allocate resources to address those risks, we reviewed FRA documentation on the National Inspection Plan (NIP) process and the Staffing Allocation Model (SAM) and interviewed relevant FRA headquarters officials, all FRA regional administrators, and FRA safety specialists in Regions 3, 4, and 5 to discuss FRA's inspection and staffing models, as well as other reports that track inspector activities and allocate resources based on risk. We used standard economic and statistical principles as criteria to assess the general reasonableness of the approach and assumptions used in the models. We also obtained information on the status of FRA's implementation of its rulemaking regarding railroads' risk reduction plans.[7] We interviewed representatives from all seven Class I railroads and eight FRA regions about how they managed safety risks, allocated inspection and other resources based on risk, and responded to changes in safety risks. We interviewed officials at our 11 selected Class II and III railroads to understand their safety challenges and how they managed safety risks. We also interviewed representatives of seven rail labor organizations and industry associations to obtain their perspectives on these issues.

[5]The Surface Transportation Board classifies freight railroads based on annual revenues. As of 2011 (the last year of data available), Class I freight railroads are those railroads that earn more than $433 million annually, Class II earn from about $35 million to $432 million annually and Class III railroads earn less than about $35 million annually.

[6]States may participate in a cooperative railroad safety program with FRA.

[7]Pub. L. No. 110-432, div. A, § 103.

To identify challenges in safety oversight and emerging issues that FRA and the railroads face, we interviewed FRA headquarters officials about changes in safety risks and FRA's plans to respond to those changes. We interviewed all FRA regional administrators and FRA Region 3, 4, and 5 safety specialists. We interviewed state rail-safety program managers in California, Florida, Illinois, and Texas and representatives from all seven Class I railroads, selected Class II and III railroads, and seven rail labor organizations about emerging and ongoing safety issues. Finally, we interviewed FRA headquarters officials and obtained documentation on their initiatives to meet current and expected human capital requirements. Appendix I contains a more detailed explanation of our objectives, scope, and methodology.

We conducted this performance audit from December 2012 to November 2013 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

The United States railroad system consists of a vast network of operations that includes over 780 railroads with more than 230,000 employees and 200,000 miles of track in operation. The freight railroad industry is dominated by the seven largest freight railroads, referred to as Class I railroads, which collectively operate over 1.7 trillion ton-miles and accounted for more than 90 percent of annual railroad-freight revenues in 2012. There are also 10 Class II freight railroads that typically operate over 350 to 900 miles per railroad, and about 750 smaller Class III freight railroads with less than 350 miles of track that typically perform point to point service over short distances. In addition, Amtrak and 29 commuter railroads collectively carry an average of about 670 million passengers a year over 23 billion miles.

FRA provides regulatory oversight of the safety of United States railroads, both passenger and freight. FRA issues and enforces numerous safety regulations including requirements governing track, signal and train control systems, highway-rail grade crossing warning systems, mechanical equipment including locomotives and cars, and railroad-

operating practices. FRA also enforces regulations related to the safe transportation of hazardous materials by rail.[8]

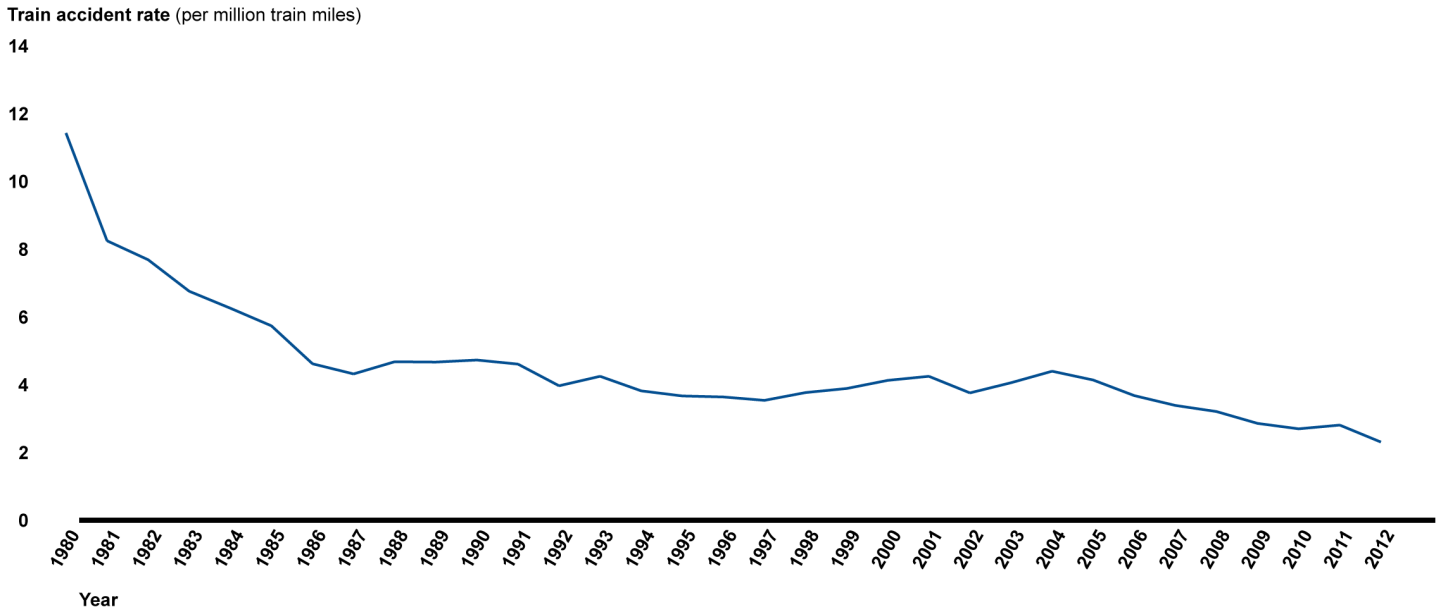
RSIA overhauled federal rail safety requirements by directing FRA to, among other things, develop additional new rail safety regulations and guidance in areas such as railroad risk reduction plans and highway-rail grade crossing safety. RSIA authorized an additional 200 positions for FRA during fiscal years 2009 through 2013, to meet these new responsibilities, but federal budget constraints have prevented FRA from filling these positions. In addition, from 2008 to 2010, FRA's responsibilities grew from its primary focus of improving safety to a broader portfolio of safety and railroad project development activities. The American Recovery and Reinvestment Act of 2009, and subsequent appropriation acts have provided more than $10 billion for rail corridor improvement, development, and planning grants.

The overall trend in rail accidents has been positive over the last 30 years. Rail accident rates declined dramatically from 1980 to 1987, and then fluctuated around four accidents per million train miles from 1992 to 2003.[9] However, there has been a clear positive trend in recent years, with the rate declining about 50 percent between 2004 and 2012. As a result, according to FRA officials and FRA data, 2012 was the safest year on record (see fig. 1).

[8]Hazardous materials regulations are issued by the Pipeline and Hazardous Materials Safety Administration (PHMSA).

[9]FRA reports the railroad accident rate as the number of accidents that cause a certain amount of property damage or injuries or fatalities to railroad workers or passengers per million train miles.

Figure 1: Train Accident Rate per Million Train Miles, 1980–2012



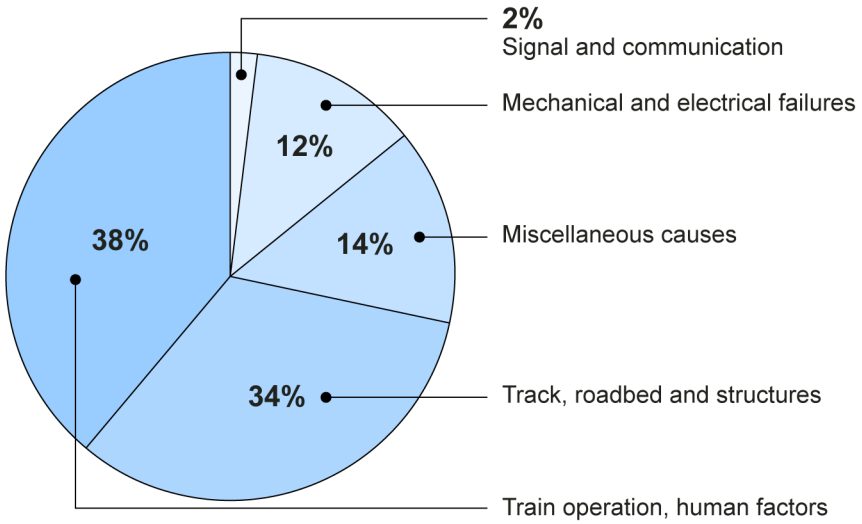
Source: FRA.

Railroads are required to report the causes and other information regarding all reportable rail accidents to the FRA.[10] FRA classifies the causes of train accidents into five categories: train operations – human factors; track, roadbed and structures; signal and communication; mechanical and electrical failures; and miscellaneous causes. According to FRA data, track and human factors causes accounted for more than 70 percent of all the 25,342 reported railroad accidents from 2003 to 2012 (see fig. 2). Those accidents caused by human factors result from actions such as improperly positioning track switches, moving train engines or rail cars without proper authority, leaving rail cars in a position that obstructs the track, or failing to secure a sufficient number of handbrakes. Accidents caused by defective track result from such things as defective

[10]A train accident is any collision, derailment, fire, explosion, act of God, or other event involving operation of railroad on-track equipment (standing or moving) that results in reportable damages greater than the current reporting threshold to railroad on-track equipment, signals, track, track structures, and roadbed. 49 C.F.R. §225.5. The threshold for reportable train accidents in 2013 was $9,900. FRA does not include highway-rail grade crossing or trespasser accidents that do not meet this property damage threshold or result in a rail worker's injury or fatality.

or ineffective crossties; broken or worn switch points; or broken, fissured or fractured rail components.

Figure 2: Train Accidents by Primary Cause, 2003–2012



Source: GAO analysis of FRA data.

Note: The miscellaneous causes category contains numerous causes such as environmental conditions, loading procedures, and unusual operating conditions, among others.

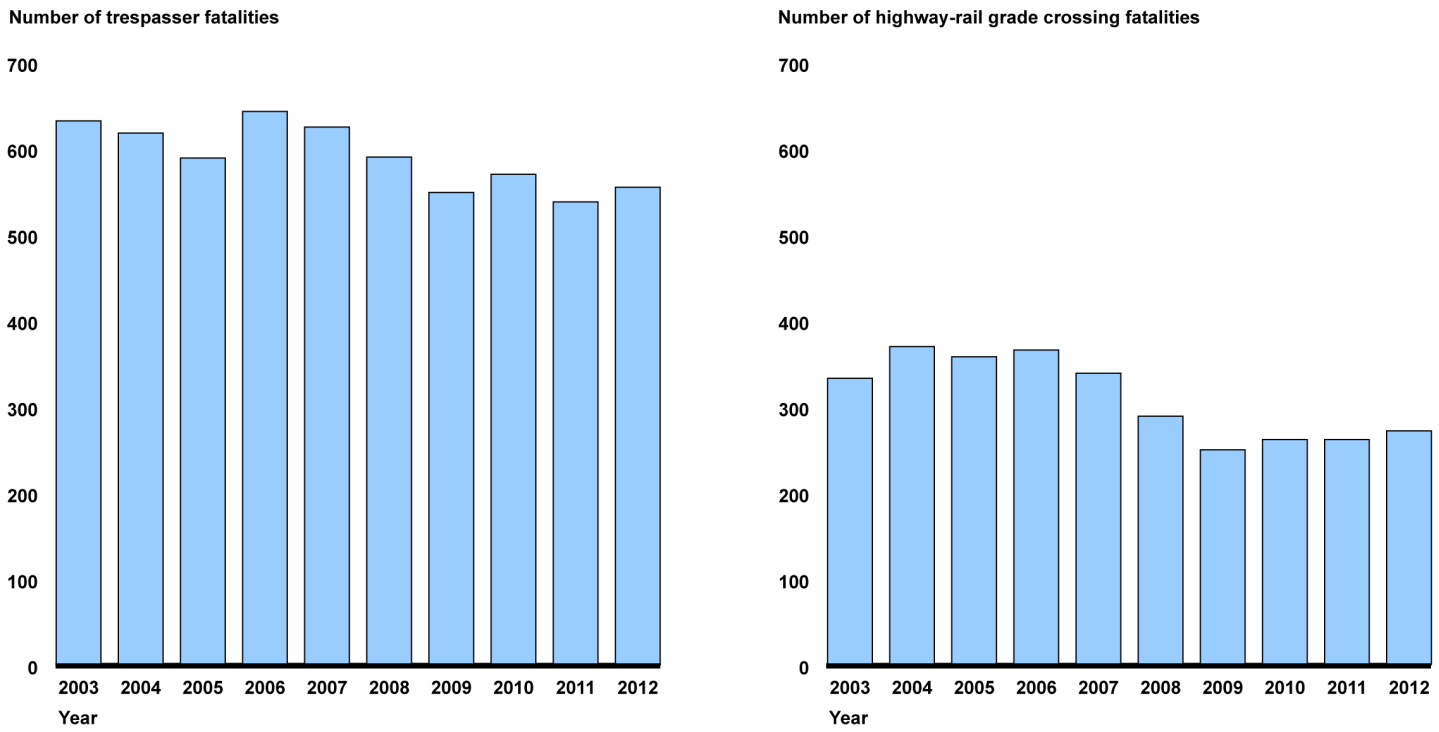
According to railroad and other stakeholders, a number of factors have contributed to improvements in rail safety including: improved financial health of railroads, investments in railroad infrastructure, and adoption of new safety regulations or safety-related technologies. Even with the significant reduction in accident rates, however, from 2003 to 2012, an average of 10 people were killed and 300 people were injured in train accidents annually.[11]

In addition to FRA-reportable train accidents, highway-rail grade crossing accidents and trespasser incidents constitute a majority of all fatalities associated with the railroad industry. In 2012, there were 271 fatalities at highway-rail grade crossings in the United States, and 554 trespasser fatalities (see fig. 3). While there has been some decline in the number of highway-rail grade crossing fatalities over the past 10 years, reducing the

[11]These figures do not include highway-rail grade crossing or trespasser fatalities.

number of trespasser fatalities has been more difficult. Improving this aspect of safety is complicated by the fact that the amount of railroad right-of-way and number of highway-rail grade railroad crossings in the United States is very large. As of the end of 2012, FRA's national inventory identified 210,621 public and private highway-rail grade crossings. Reducing highway-rail crossing and trespasser fatalities is difficult because a train cannot swerve or easily stop to prevent collisions. According to FRA officials, the average freight train is about one to one-and-a-quarter miles in length and at 55 miles per hour it can take a mile or more to come to a stop after the locomotive engineer applies the emergency brake.

Figure 3: Trespasser and Highway-Rail Grade Crossing Fatalities, 2003–2012



Source: GAO analysis of FRA data.

FRA's Rail-Safety Oversight Framework Relies on Compliance-Based Inspections

FRA conducts inspections to ensure railroads' compliance with federal safety regulations. Thirty states also partner with FRA in providing FRA-certified state railroad-safety inspectors, who have been delegated authority to enforce federal safety regulations. Many railroads have additional safety programs, rules, and technologies beyond the required federal standards.

FRA Relies on Inspections to Ensure Railroads' Compliance with Federal Safety Regulations

FRA is a small agency with limited resources available to execute the large scope of its oversight responsibility especially compared to the size of the industry it regulates. By FRA's own estimation, its inspectors have the ability to inspect less than 1 percent of the federally-regulated railroad system. Therefore, railroads have the primary responsibility for safety, and FRA relies on a number of strategies to achieve the maximum possible oversight of the system. These strategies include conducting inspections, enforcing compliance with regulations, issuing new regulations, and coordinating with industry to employ additional safety measures beyond the federal requirements, when possible.

FRA executes its regulatory and inspection responsibilities through a staff of railroad safety experts, inspectors, and other professionals.[12] For example, to determine a railroad's compliance with FRA regulations, inspectors examine track, equipment, signal devices, employee actions, and procedures and review maintenance and accident records. FRA also conducts focused inspections involving inspectors from a variety of disciplines or multiple inspectors from a single discipline, working together at a specific location or rail facility to target railroad issues that pose the greatest safety risk, based on inspection data, accident history, rail traffic density, and professional judgment.

As of fiscal year 2013, there were 347 FRA safety inspectors, in five safety disciplines, assigned to eight regional offices across the nation. These disciplines are track, signal and train control, motive power and equipment, operating practices, and hazardous materials. (See table 1.)

[12]FRA requested 881.5 full-time equivalents (FTE) to fund FRA's portfolio of rail safety and development programs in fiscal year 2014. The request included 22.5 additional FTE to support safety programs and help oversee the grant programs, which was an increase compared to prior fiscal year. Currently, FRA has 98 percent of its inspection positions filled.

In addition, FRA's regional offices include safety specialists and program managers for highway-rail grade crossing safety and trespass prevention.

Table 1: Federal Railroad Administration's Inspection Disciplines and Total Number of FRA Inspectors, as of April 2013

Discipline	Examples of what inspections cover (not all inclusive)	Inspector Total
Track	Condition of track and structures, including track components and geometry, railroad track inspections, and programs to maintain continuous welded rail track and protect roadway workers. (In addition to manual inspections, FRA has an automated track inspection program that uses data produced by vehicles that precisely measure track geometry.)	**78**
Signal and train control	Signal switching systems, locomotive signal devices, locks and brake application, including related recordkeeping, testing, modifications, and repairs.	**59**
Motive power and equipment	Design and operation of railroad rolling equipment, including railroad freight and passenger car safety, locomotive safety and maintenance, safety devices, brake system safety, and emergency preparedness procedures.	**81**
Operating practices	Railroad operations related to human factors, including employee compliance with railroad operating rules, railroads' monitoring of this compliance, drug and alcohol testing of employees, employees' hours of service, radio communications, locomotive engineer qualification, and accident and incident reporting.	**79**
Hazardous materials[a]	Rail transportation of hazardous materials, including the integrity, markings, maintenance, and placement of tank cars, the training of train crews, security, and emergency preparedness.	**50**
Total		**347**

Source: GAO Analysis of FRA Information.

Note: There is a total of 664 FRA safety staff located at FRA headquarters and regional offices; 173 are located in headquarters and 491 in the field. This FRA safety staff total includes the 347 railroad safety inspector positions, as well as specialists, engineers, economists, administrative, and other positions. As of April 2013, 23 of these 347 positions were vacant. Additionally, about 30 percent of FRA safety field employees will be eligible to retire in the next 5 years.

[a]FRA enforces regulations issued by the Pipeline Safety and Hazardous Materials Safety Administration (PHMSA) for hazardous materials.

Railroads are required to comply with the safety standards set in federal safety regulations. When railroads do not comply or identified defects are serious, FRA may cite violations and assess civil penalties, either against railroads or individuals. Thus, FRA's approach is compliance-oriented and does not holistically assess safety problems across a railroad's system. On average, FRA collected about $15.4 million per year in civil penalty final assessments or settlements between fiscal years 2009 through 2012. Although FRA uses civil penalties as its primary enforcement tool, under its authority, it can also take other enforcement actions. For example, FRA can issue warnings, special notices for repair, compliance

and emergency orders and disqualification orders.[13] For example, in 2012, to remove an imminent and unacceptable threat to public safety, FRA issued an emergency order to prevent operation of trains over a highway-rail grade crossing until the railroad restored the active warning devices to proper working order. Figure 4 shows a serious defect identified by an FRA motive power and equipment safety inspector while conducting an inspection prior to a train departure. A broken safety appliance such as the inoperable hand brake wheel can result in the inability to properly secure a train during an emergency and can result in the injury or death of a railroad employee. This defect resulted in a citation because the condition did not meet the federal railroad safety appliance standard.

Figure 4: An Inoperable Bent Hand Brake Wheel

Source: FRA.

[13]Most of the FRA regulatory authority is codified under 49 C.F.R. pts. 200 to 244.

In 1996, FRA implemented a collaborative approach to developing and issuing rail safety rules and regulations by creating the Railroad Safety Advisory Committee (RSAC). The RSAC includes stakeholders in the rail community such as government entities, railroads, rail labor organizations, trade associations, suppliers, and others that work with FRA to develop solutions to railroad safety and regulatory issues. FRA develops and issues rail safety rules and regulations while involving RSAC members in the rulemaking process. The RSAC recommendations are advisory, and FRA may deviate from them, if it so chooses. Recent RSAC-supported rulemakings have addressed passenger rail hours of service, conductor certification, locomotive safety standards, and positive train control. Achieving consensus from the stakeholders can be challenging and time-intensive; however, six Class I railroads, one rail labor organization, and one other rail-safety stakeholder we interviewed told us they believe this process is an improvement over FRA's prior approach, which did not include them in the process before issuing a notice of proposed rulemaking. In addition, they noted that in general, the RSAC partnership has improved the quality of railroad safety initiatives and fostered a greater level of compliance with safety regulations.

Even with the RSAC process, new technologies pose a challenge to FRA regulations. In 2008, FRA noted that its regulations cannot keep up with the rapid pace of technological change, citing, for example, the 8 years it took to put one new technology signal and train control regulation in place. According to railroad officials, FRA is not always able to quickly adapt and respond to new railroad technologies. This situation affects the FRA inspectors' ability to maintain oversight. For example, two Class I railroad officials we spoke with said that technological improvements such as automated sensors that measure physical attributes or thermal output on trains can be more comprehensive and identify defects that visual inspections cannot. In contrast, officials from two rail labor organizations we spoke with stated that technological advances, such as the use of automated sensors, should supplement or enhance inspection capabilities and not replace physical inspections.

FRA supplements oversight of Class I railroads through the Railroad System Oversight program, established in October 2005. In addition to addressing safety compliance issues, this program addresses safety issues not subject to regulation, such as aspects of worker fatigue. Under this program, the agency assigns an FRA manager to work with each Class I railroad on identifying and resolving safety issues. According to FRA officials, these managers analyze accident and inspection data for their assigned railroad, and support FRA's inspection and enforcement

efforts. Under this program, FRA has begun annual meetings with the leadership of each Class I railroad to discuss its safety performance. Officials from two Class I railroads we interviewed said that their participation in this oversight program has enhanced their ability to ensure safety.

In addition to the FRA oversight initiatives mentioned above, there are other FRA initiatives that contribute to the overall safety framework. Some of these other initiatives include partnering with organizations to increase safety awareness; coordinating efforts on research and development to test and evaluate the safety of locomotives, vehicles, track components, and signaling devices; and offering training to Class II and III railroads to ensure they are informed of changes in regulations and that railroad safety and any other concerns are being addressed. For example, FRA, in collaboration with the Association of American Railroads (AAR) operates the Transportation Technology Center (TTC) located in Pueblo, Colorado. The TTC is a 52-square mile test center that enables isolated testing and evaluation of freight and passenger rolling stock, vehicle and track components, and safety and signaling devices at a array of specialized laboratories and on 48 miles of high-speed railroad track. According to AAR officials, all classes of railroads have access to utilize the testing and evaluation center and can benefit from the resulting technological improvements made to safety. Also, the American Short Line and Regional Railroad Association (ASLRRA), in conjunction with FRA, offers numerous training seminars to Class II and Class III railroad employees to increase their knowledge of important aspects of railroad operations, including recent federal regulatory changes and oversight issues specific to the five railroad safety disciplines.

State Inspectors Augment FRA's Oversight, but Inspection Coverage and Coordination Vary

Thirty states have rail safety programs that partner with FRA to augment and support the national railroad safety effort. Under the current program, each participating state enters into an agreement with FRA to provide enhanced investigative and surveillance capability.[14] Under this program FRA delegates oversight and enforcement authority to these state inspectors, who are recruited and trained in disciplines that align with the

[14]The FRA State Rail Safety Participation Program is a voluntary state safety-inspection program that allows states to enter into an agreement with FRA in which state railroad safety inspectors are delegated authority to enforce federal regulations. 49 C.F.R. §§ 212.101 - 212.115.

FRA's inspection disciplines and are required to pass mandatory FRA training before they can be FRA-certified as qualified to perform inspections. Inspectors who participate in this program submit inspection reports to FRA and enforce federal rail-safety regulations. State participation in this voluntary program varies and, according to FRA data, there are about 170 state inspectors in all. More than half of all state inspectors are concentrated in six states: California, Illinois, Ohio, Pennsylvania, Texas, and West Virginia. In contrast, twelve participating states have small programs with only one or two inspectors, and 20 states do not have any inspectors. California has the largest state program, with 35 inspectors in all five federal rail-safety inspection disciplines.

According to FRA region and state program officials we interviewed, the level of coordination between federal and state inspectors varies from state to state. Inspectors may divide up territories to ensure more inspection coverage to maximize their limited resources. For example, in one state, state track and structure inspectors take primary responsibility for part of the state, allowing FRA track and structure inspectors the flexibility to be deployed in another part of the state. In other states, the federal and state inspectors may cover the same territory and conduct inspections simultaneously, with or without advance coordination. FRA and state inspectors may also collaborate on joint or focused inspections. On the other hand, according to FRA regional and state officials, in some states coordination happens between individual state and federal inspectors in an informal manner. Representatives from five Class I railroads we spoke with said there appeared to be good coordination between the federal and state inspectors.

Railroads Also Conduct Inspections, and Many Have Safety Initiatives beyond Federal Regulations

Railroads must adhere to all federal railroad regulations, which govern safety requirements, and applicable state railroad regulations in the states in which they conduct railroad operations. The railroads have primary responsibility for their own safe operation, and each performs its own safety activities including reviewing track inspection reports for accuracy, performing tests on electronic devices, understanding and utilizing automated test data, identifying and analyzing defective components, and identifying necessary corrective actions. Across all classes of railroads, most railroad officials said that they adopted a range of safety oversight approaches and technologies intended to provide additional assurance of safety beyond the required federal regulatory safety standards. Railroad officials we spoke with provided examples of various initiatives they have

instituted and ways in which they address their self-identified safety risks. For example, Class I railroads have:

- Participated in the Switching Operations Fatality Analysis (SOFA) reporting. SOFA is a voluntary, non-regulatory, workplace-safety partnership with railroads, rail labor organizations, industry associations, and FRA. It was formed to look for commonalities among the fatalities that occur during switching operations and to develop findings and recommendations that will aid in preventing railroad employee deaths.

- Developed various policies, programs, incentives, and analyses to discourage unsafe behavior and encourage safe behavior through training, visual reminders of the importance of safety, and financial incentives for safe workplace habits. Also, five Class I railroads–as encouraged by a rail labor organization–conduct root-cause analyses to determine why and how an accident occurred, and what can be done to prevent similar accidents in the future across their rail systems.

- Participated in or have operating practices similar to the Confidential Close Call Reporting System[15] (C3RS), which allows railroad employees to report close call events or "near-misses." This effort helps to identify safety trends within the rail network, learn about potentially unsafe conditions, and improve safety practices to avoid an accident or incident with more serious consequences.

- Focused on improving the way training procedures and practices are provided to railroad employees. Railroads have cited the use of locomotive simulation training machines that allow train crews to learn

[15]C3RS is a risk reduction initiative that was designed to help adapt a confidential reporting system to the needs of the United States railroad industry and to evaluate its effectiveness in improving safety. Beginning in February 2007, FRA sponsored pilot projects on divisions of four railroads: Union Pacific Railroad, Canadian Pacific Railway, New Jersey Transit, and Amtrak (nine yard locations). FRA plans to expand the C3RS implementation by adding new railroads. Of the four railroads participating in the pilot projects, the Canadian Pacific Railway completed its agreed-upon 5-year test and elected not to continue. The Union Pacific Railroad requested to be allowed to continue beyond its 5-year completion date and is making plans to add more sites. New Jersey Transit is preparing to include mechanical employees in its program, and Amtrak expanded the program across its system for operating practices employees and is considering adding mechanical employees to its program.

and make mistakes without consequences, and test their skills to determine competency in realistic scenarios. This type of training helps railroad training officials and management understand where improvements can be made and areas to focus on training locomotive employees who operate on certain trains and along different routes.

- Incorporated new technologies and reinvested in infrastructure and equipment, which has enhanced safety by allowing railroads to be proactive in identifying various safety issues. Five Class I railroads have cited the importance of using "machine vision" technologies and wayside detection systems to identify undue stresses and potentially unsafe conditions on railroad tracks, wheels, and other railroad equipment.[16] According to officials at one Class I railroad, the analysis of the detector information can supplement mechanical analysis to help determine when a train should be taken out of service for mechanical components that are not operating consistently or that are failing faster than others. Another Class I railroad cited the use of inward-facing locomotive cab cameras to identify electronic device distractions or issues that they would have not otherwise known needed to be addressed, such as engineers' not wearing seatbelts.

In addition to the initiatives mentioned above, there are other activities that railroads, states and local entities, and safety organizations are involved with that also contribute to the overall safety framework. These other contributing initiatives include public education and outreach, enforcement, engineering, and evaluation. For example, Class I railroads have hosted an "Officer on A Train" event, in which participating railroads partner with local law enforcement to promote compliance with state motor-vehicle laws and penal codes on highway-rail grade crossings and rights-of-way. Also, state departments of transportation, local law enforcement, and railroads have partnered with Operation Lifesaver[17] by

[16]"Machine vision" consists of recording digital images and videos and using algorithms to detect certain attributes in these images which can provide greater objectivity and reliability as well as data archiving and trending capabilities for many track components. Wayside detection systems measure characteristics such as wheel and bearing temperature and wheel geometry as trains pass, to monitor for predictive maintenance and to help identify defects before derailments occur.

[17]Operation Lifesaver is a public-private partnership that promotes awareness to help save lives lost in highway-rail grade crossing collisions and from trespassing on railway property. It works with the rail industry, government, police, unions, many public organizations, and community groups.

providing presentations to schools, community organizations, driver's education classes, as well as teaming up to provide education at weekend events such as festivals and safety fairs. Together these entities work to ensure that public education about the hazards surrounding railroad property and trains, implement railroad engineering initiatives to increase safety and reduce trespassing and injuries and deaths, and encourage police enforcement to discourage unsafe actions and ensure public safety around railroads.

FRA Uses A Risk-Based Approach to Direct Inspections, but Has Been Slow to Implement Broader Risk Reduction Planning

Since 2006, FRA has developed a risk-based approach to help direct its inspection efforts, but FRA regional officials expressed concerns about how well its risk-based model appropriately balances inspector needs in their regions. RSIA mandated risk reduction plans for Class I, passenger (commuter and inter-city), and other railroads that FRA determined needed such plans based on safety performance. The development of this risk reduction approach to oversight is intended to augment FRA's current inspection regime and is a significant departure from FRA's traditional compliance-driven approach. However, FRA has not yet issued the final rule directing railroads to develop such plans, which, under RSIA, was to be issued by October 2012.

FRA's National Inspection Plan and Staffing Allocation Model Incorporate an Assessment of Risk

FRA has developed a risk-based approach to its inspection program using two quantitative tools to help direct its inspection efforts. First, in 2006, FRA developed the National Inspection Plan (NIP) process to use safety risk information to help target limited inspection resources to areas of higher risk.[18] There are three steps to the NIP: (1) a quantitative model produces an initial, baseline set of targets for inspections; (2) FRA regions discuss the baseline targets with headquarters and adjustments are made to the initial inspection targets; and (3) the NIP is updated mid-year to adjust for unforeseen events that required the use of inspection resources, such as accident investigations or changing safety conditions.

[18]We previously reported that the NIP had allowed FRA to better target inspections based on risk, and was an improvement over its previous approach, which was less structured and consistent. GAO, *Rail Safety: The Federal Railroad Administration Is Taking Steps to Better Target Its Oversight, but Assessment of Results Is Needed to Determine Impact*, GAO-07-149, (Washington, D.C.: Jan. 26, 2007);

The NIP's quantitative model minimizes the predicted number and severity of railroad accidents given the number of available FRA inspectors in each FRA region. The quantitative model for making this estimation uses data including: (1) the most recent 3 years of accident data from reports that railroads are required to file about accidents that occur on their tracks,[19] (2) data from FRA and state inspection activity, and (3) information on railroad activities such as train miles and other data. The model uses these data to determine the scope of what FRA's inspectors should inspect in a given year.[20] The NIP model provides targets for the amount of inspection activity each FRA inspector should have at each railroad within each state. After the baseline inspection targets are established, FRA's regional directors propose modifications to the inspection targets produced for each region, using their judgment and knowledge of which railroads or disciplines may require more FRA oversight than the NIP's model indicates. As a result of these discussions, FRA headquarters and regions arrive at a modified set of inspection targets. All the FRA regional administrators told us that the flexibility in this process allows them to target inspection needs based on changing conditions in their regions.

FRA headquarters officials stated that the NIP model is not designed to account for newly emerging risks or react swiftly to recent accidents. Consequently, FRA allows for a mid-year correction of the NIP targets, based on input from FRA's regional management. FRA regional administrators we spoke with indicated that this flexibility can help address new or emerging rail safety risks by deviating from the original NIP targets. For example, they stated that they sometimes re-allocate inspection targets to railroads that have had recent accidents, or because inspectors indicate a need for more oversight at a certain railroad based on assessments made during their regular inspection duties. Throughout the year, according to FRA regional administrators we spoke with, FRA headquarters and regional management monitor the inspection activities against the modified inspection baseline to determine if the inspection

[19]Railroads are required to report monthly accident data and it may take 2 to 3 months for FRA to review the data and make it available for use in the NIP. FRA operating practices inspectors are responsible for reviewing railroad accident and incident records reporting, and may cite the railroads for violations leading to civil penalties for failing to adhere to reporting regulations.

[20]The NIP model does not include highway-rail grade crossing and trespasser accidents in its analysis.

targets are being met. FRA's regional administrators use the NIP to monitor and help manage the use of inspectors with "dashboard" reports that track progress in meeting plan targets. FRA regional administrators and supervisors said the dashboards are a good tool that gives them a quick review of their plan progress. Inspectors are expected to stay within 2.5 percent of the NIP inspection targets and supervisors generally direct the activity of inspectors to meet the goals.

In addition to the NIP, FRA has also developed the Staffing Allocation Model (SAM), which is a planning and evaluation tool used to assess its inspection resources from a nationwide perspective. FRA uses the SAM to establish targets for the number of inspectors in four FRA inspection disciplines across all eight regions.[21] In using the targets to help allocate and balance staff among disciplines and regions, FRA expects to minimize the resulting estimated costs of train accidents, including casualties. FRA uses the SAM results to determine where it may need to adjust the number of inspectors in a given region and discipline, given the resource constraints provided by the total number of inspector positions.

In 2007, the SAM model results indicated that there needed to be a change in the relative number of inspectors among the disciplines. FRA rebalanced its workforce using the SAM results, increasing the number of track inspectors and reducing the number of equipment inspectors. FRA officials stated that more recent SAM outputs have not indicated the need for major movements of inspectors between regions or disciplines. As of April 2013, no region and no inspection discipline within any region varied by more or less than two positions from the SAM model result; at that time FRA had 324 full-time inspectors and 23 vacant inspector positions. While FRA headquarters officials anticipate that there may be minor variations from SAM's targets as a result of natural turnover of inspectors (e.g., retirements), they do not believe that these temporary variations will have long-term effects on FRA's safety activities in the regions. However, FRA officials also stated that when the SAM calls for a change in the distribution of inspectors, they are somewhat limited in their ability to implement changes due to federal budget constraints. Adding new inspector positions in one region requires the rebalancing of inspector positions in another region.

[21]FRA hazardous materials inspectors are not allocated by the SAM because different factors determine the need for hazardous materials inspectors.

Regional Officials Have Concerns about FRA's Process to Allocate Staff

Although FRA regional administrators we spoke with stated that the NIP process provides them with a good tool for planning for yearly inspection needs in their regions, all eight regional administrators told us that they see limitations in the process that FRA uses to determine staffing allocations. Further, all eight administrators noted that the staffing allocation model does not always reflect the appropriate inspection needs in their regions. FRA regional administrators can provide input to FRA headquarters on the model's results based on their views of how many inspectors the region needs; however, the overall process for determining inspector resources across the regions was perceived by the administrators to be much less flexible than the NIP process. Specifically, several regional administrators told us that even though they have inquired about obtaining inspectors in a specific discipline to meet current safety inspection needs, they were generally unable to get additional inspectors because the staffing process is not flexible enough to meet these demands. They also expressed concern over the staffing pressures this can create, as they are forced to spread inspectors over larger territories, sometimes spanning several states.

FRA headquarters officials also told us that while the SAM model provides an initial basis for allocating staff, and has been refined based on what they have learned from making improvements to the NIP model, the SAM is not designed to take into account certain changes. For example, it does not quickly reflect increasing freight train volume or increasing accidents in a particular region because the SAM uses past accident data to provide a baseline for the nationwide distribution of its inspectors. Over time, changes in accident data will be reflected in the model, but this will be evident some time after the change has occurred. While the SAM model allows FRA to account for some risks, it is not designed to anticipate quickly changing circumstances that may affect risk such as changes in the type or amount of freight traffic in a region. FRA officials stated that they handle those types of changes to inspector needs on an as-needed basis through temporary detail assignment of FRA inspectors from other regions or headquarters.

FRA's ability to quickly adjust to changing conditions also is affected by the fact that hiring and staffing decisions are long-term decisions, and filling a gap in staffing with a qualified person can take years. According to FRA officials, it can take 1 to 2 years to find, hire, train, and certify a new inspector with previous railroad experience, and 3 to 4 years to certify an inexperienced trainee. For example, in one case, an FRA regional administrator stated that when the staffing decisions did not provide for a replacement for a certain discipline, he covered that

inspection load with inspectors from other states for 3 years until a replacement could be approved, hired, trained, and qualified.

FRA Has Missed the Mandated Deadline to Implement a Comprehensive Risk Reduction Approach

FRA was required to issue a rulemaking for railroads' development of risk reduction plans within 4 years of RSIA's enactment. Although FRA issued an Advance Notice of Proposed Rulemaking and a Notice of Public Hearings, the agency has been slow to issue final regulations for the railroads to follow in developing the plans, and FRA missed the October 2012 deadline for requiring certain railroads to develop and implement risk reduction plans. RSIA mandated that all Class I railroads, passenger railroads, and any railroad that FRA determines has inadequate safety performance develop a risk reduction plan and have it approved by FRA.[22] The risk reduction concept is a comprehensive, system-oriented approach to safety that first determines an operation's level of risk by identifying and analyzing applicable hazards and then develops plans to mitigate that risk. The objective is to identify and mitigate those risks proactively, with the intent of reducing or eliminating risks before an accident, injury, or fatality occurs. Railroad and rail-labor officials we interviewed said the risk reduction approach has the potential to improve safety because it provides the opportunity to identify the root cause of safety problems across a railroad's system. As required by law, each railroad's Risk Reduction Program Plan must include a risk-based hazard analysis, a Technology Implementation Plan and a Fatigue Management Plan.[23]

According to FRA officials, a significant factor in the delay resulted from the railroads' concerns about access to information contained in the plans that could affect railroad liability. In particular, railroads expressed concern that risks identified in the plans would leave them exposed to legal liability in the case of an accident.[24] FRA chose to split the risk

[22]Railroads required to submit risk reduction plans account for most United States rail activity, but many non-Class I freight railroads will not be required to submit risk reduction plans; they may, however, opt to develop such plans.

[23]Pub. L. No. 100-432, div. A, § 103.

[24]Risk Reduction plans submitted to FRA, as required by RSIA, are not subject to the Freedom of Information Act. Additionally, FRA may prohibit the public disclosure of risk analyses or risk mitigation analyses it has obtained if the Secretary of Transportation determines that the prohibition of public disclosure is necessary to promote railroad safety. 49 U.S.C. § 20118.

reduction plan process for freight and passenger railroads, and passenger-railroad guidance has progressed further than freight-railroad guidance. Under this split approach, passenger railroads will be required to have a System Safety Plan (SSP), a comprehensive process for the application of engineering and management principles, criteria, and techniques to optimize safety that might require a railroad to manage risk and to develop proactive hazard management methods that would support safety improvement. FRA expects to issue the final rule for the SSPs in early 2014.[25] In addition, agency officials told us that they continue to work through their RSAC process to develop guidance and FRA anticipates issuing a final rule for the freight railroads' Risk Reduction Program plans in early 2015 and expects that the railroads will have approved risk reduction plans in place by 2016.[26] Implementing such an approach will likely take several years particularly given that FRA estimates that it will not complete the approval of railroads' plans until 2016. This delay continues to prevent FRA from implementing proactive oversight to help mitigate safety risks through risk management plans.

The Department of Transportation's Inspector General has also reported on delays in FRA's rulemaking related to a number of RSIA's mandates. It recommended that FRA develop a plan for completion of outstanding RSIA-related rulemakings, including milestones for completion and a description of FRA's rationale for prioritizing rulemakings. However, FRA only partially concurred with this recommendation.[27] During our review, the agency had not yet developed an interim plan with specific time frames to direct and manage the implementation of the risk reduction program to prevent further delays. Developing a report that outlines these time frames and the steps needed to implement the program could help ensure that FRA identifies risks associated with the start of the program

[25]Amtrak is among the passenger railroads covered and Amtrak officials said they were confident they could meet the requirements of the SSP, as Amtrak has had a System Safety Program in place since August 2006 that should meet many of the requirements.

[26]According to FRA officials, both the passenger and freight rules could be issued earlier if the Office of Management and Budget deems the rules to be non-significant.

[27]The Inspector General did not find FRA's response to its recommendation to be fully responsive, and still recommended that FRA report a strategy, including milestones for completing its rulemaking, to resolve the recommendation. Department of Transportation, Inspector General, *FRA is Nearing Completion of Rules Required by the Rail Safety Improvement Act, But Needs to Improve Oversight*, CR-2013-070 (Washington, D.C.: Apr. 17, 2013).

and would allow FRA to better inform Congress and other stakeholders of its progress in implementing the risk reduction program.

This is particularly important in light of the fact that implementing the more comprehensive risk-based approach to safety is a significant procedural and cultural change for FRA and the railroad industry. One Class I railroad official we interviewed observed that when his railroad instituted a risk reduction approach, employees had to think differently, in "root cause" terms rather than individual safety defects, and it was a difficult cultural transition. The addition of a risk reduction approach to FRA oversight will likewise be a cultural shift. As we noted earlier, FRA's current oversight framework is largely a compliance-based framework, focused on ensuring adherence to federal safety regulations—the safety standards a railroad must meet. While FRA will continue with its current compliance-based inspections, auditing a railroad's comprehensive approach to safety across its operations, as a risk reduction plan requires, is a substantially different task.

Moreover, this is the first time that FRA has overseen risk management at the system level. Other agencies involved in transportation safety, including the Pipeline and Hazardous Materials Safety Administration (PHMSA) and the Federal Aviation Administration (FAA), have utilized risk management approaches, in addition to standard compliance-based inspections, to enforce their safety rules and regulations. For example, prior to 2003, PHMSA traditionally performed its oversight role using safety standards that all operators must meet. However, PHMSA's gas integrity management program is designed to improve pipeline safety by supplementing standard safety requirements with risk-based management principles, including performance indicators to measure progress. To implement the gas integrity management program, PHMSA had to develop both specialized training for its safety inspectors and a workforce plan that identified the resources and expertise it needed. Our past review of this program concluded that the gas integrity management program enhanced pipeline safety.[28] Similarly, FAA is currently undertaking a broader risk-management approach called Safety Management Systems (SMS). SMS is designed to address cultural and organizational problems that lead to safety hazards, identifying system-

[28]GAO, *Natural Gas Pipeline Safety: Safety Integrity Management Benefits Public Safety, but Consistency of Performance Measures Should Be Improved,* GAO-06-946 (Washington, D.C.: Sept. 8, 2006).

wide trends in aviation safety, and managing the hazards before they result in accidents.[29] Our past review of FAA's implementation of SMS noted that FAA needed to acquire skills not currently found in its workforce to implement this change.[30]

FRA anticipates that oversight of risk reduction plans will increase the agency's workload and require the addition of a new safety discipline, as the task of reviewing and approving the plans is significantly different than conducting safety inspections in the five traditional disciplines. To review and approve the risk reduction plans, FRA has hired three staff with experience in this safety approach and requested funding to hire an additional 10 risk-management specialists in its fiscal year 2014 budget submission. FRA officials stated that these specialists will both review railroad risk reduction plans and audit, in a broader sense, plans, data and other performance indicators generally without requiring an onsite presence at a railroad. Risk-management specialists will need to be able to identify systemic issues such as a need for training, as well as understand specific technical problems, and to serve as leaders of teams that will include relevant discipline inspectors or specialists.

FRA Faces Challenges to Rail Safety Oversight, and Lack of a Strategic Human Capital Plan Hampers Its Ability to Respond to These Challenges

FRA faces several ongoing and emerging challenges to its rail-safety oversight framework. These challenges include how FRA will: respond to highway-rail grade crossing and trespasser fatalities; accommodate adverse weather conditions; adjust its resources to industry changes like increasing rail traffic flows; adapt to the new safety implications posed by technology changes in the railroad industry, such as Positive Train Control (PTC); implement its new comprehensive safety risk reduction program; and ensure it has enough inspectors to fulfill its current and future oversight workload. While FRA has developed long-term rail safety goals, FRA's ability to meet those goals and to respond to these challenges is hampered by its lack of strategic human capital planning. A strategic human capital plan would help define how FRA will ensure that its workforce will have the skills and the resources to meet these

[29]This proactive approach is needed because aviation accidents have become increasingly rare events and less information is available for reactive analysis of accident causes.

[30]GAO, *Aviation Safety: Additional FAA Efforts Could Enhance Safety Risk Management*, GAO-12-898 (Washington, D.C.: Sept. 12, 2012).

challenges. Without a human capital plan, FRA may not have trained, qualified workforce of inspectors and specialists in place to carry out its current inspections or to oversee the railroad industry's implementation of PTC or comprehensive safety risk reduction plans.

FRA Faces Several Ongoing Safety Challenges

Highway-rail Grade Crossing and Trespasser Fatalities

Highway-rail grade crossing collisions and trespasser fatalities are ongoing problems currently handled outside of FRA's compliance-based rail-safety oversight framework. Addressing highway-rail grade crossing collisions involves a variety of railroad and non-railroad actors, such as state highway departments, local governments, and the general public. In addition, the Rail-Highway Crossing Program administered by the Federal Highway Administration (FHWA) grants funds for highway-rail crossing safety improvements.[31] States determine what improvements need to be made at highway-rail grade crossings, and typically use the federal program to pay railroads to make the planned improvements. About 48 percent of public highway-rail grade crossings are equipped with active warning devices, such as flashing lights and gates. Rail safety stakeholders such as railroad and FRA officials stated that the current level of funding is inadequate to address the magnitude of the problem; however, FHWA officials noted that the level of funding is high per fatality compared with other types of auto fatalities, which account for many more deaths per year.

According to rail safety advocates, educating the public, enforcing traffic laws, and developing engineering improvements at highway-rail grade crossings are the three key elements of improving highway-rail grade crossing safety. As such, FRA employs railroad highway-rail grade crossing managers in each region who work with local communities to try to resolve highway-rail grade crossing issues. These managers do not perform railroad inspections, but rather perform a wide range of tasks including interacting directly with elected officials and the public on the topic of highway-rail grade crossing safety, establishing "quiet zones",

[31] 23 U.S.C. § 130.

and closing highway-rail grade crossings.[32] Officials from FRA, the railroads, and Operation Lifesaver emphasized the importance of educating the public about highway-rail grade crossing safety and closing crossings wherever possible. The railroads have made progress in recent years in reducing the total number of highway-rail grade crossings, and railroads may provide funds to local communities if they close or consolidate highway-rail grade crossings. For example, one Class I railroad we interviewed cited a program through which it offers communities up to $10,000 if the community will close the highway-rail grade crossing. FRA regional and railroad officials noted how difficult it can be to get a community to close a highway-rail grade crossing due to the local residents' interest in maintaining convenient access to the community or because closing a highway-rail grade crossing could increase the amount of time it takes for emergency response personnel to reach someone in need. As of 2012, there were 210,621 public and private at-grade crossings, about 36,000 fewer than in 2003.[33]

In addition to highway-rail grade crossing concerns, trespasser fatalities remain an on-going challenge for railroads. The rates of trespasser fatalities have seen little improvement in recent years. The sheer amount of railroad track throughout the United States makes preventing trespassers difficult to address, and railroad officials noted that trespassing cannot be easily predicted or controlled. In some cases these events are suicides, which are particularly difficult to control. Officials we interviewed at one railroad said they have tried posting suicide hotline information in potential hot spots in the hope that they might, at the last moment, help deter the victim.

While progress in the area of trespasser fatalities has been slow, some noteworthy efforts are being made. Amtrak officials said that they recently conducted a mapping analysis to try to determine trespasser hot spots, and in doing so discovered the worst problem locations; Amtrak now

[32]A quiet zone is a segment of a rail line that contains one or more consecutive public highway-rail grade crossings at which locomotive horns are not routinely sounded. 49 C.F.R. § 222.9.

[33]Highway-rail grade crossings may be removed from the inventory due to abandonments or closures, and new crossings may also be added to the inventory. FRA data does not identify exactly how many highway-rail grade crossings have been closed on active rail lines. An at-grade crossing refers to the general area where the roadway intersects with or crosses the railroad track.

hopes to develop ways to address the problems in these places. In addition, the Volpe National Transportation Systems Center is conducting a study of trespasser problems in West Palm Beach, Florida.

Adverse Weather Conditions

Railroads also face a variety of ongoing adverse weather conditions that affect safety for railroad crews, passengers, and the communities they serve and run through. Extreme heat or cold, floods, tornadoes, wildfires and hurricanes can affect rail operations and infrastructure. For example, during periods of extreme heat, railroad tracks (especially newer "continuously-welded" railroad tracks) can expand out of alignment without warning causing train derailments.[34] During periods of extreme cold, tracks may contract causing the rails to break as well. To counter these threats, FRA has certain regulations related to weather conditions, such as standards related to bridge safety and track safety, when adverse weather events such as fires, floods, and extreme heat conditions could affect the rail infrastructure. Railroads we spoke with have also established procedures for weather-related risks, including very specific operating practices to be followed during or prior to these adverse weather events. For example, railroads we interviewed commonly reduce speeds during periods of extreme heat or cold to avoid derailments due to track misalignment or broken rails (see fig. 5 below for examples of the effects of adverse weather on railroad track). FRA has worked with the railroad industry through the RSAC process to determine what measures need to be taken to prevent the effects of adverse weather on continuous welded rails.

[34]According to FRA, "continuously-welded" rail refers to the way in which rail is joined to form track. Continuous welded rails are welded together to form one uninterrupted rail that may be several miles long in contrast to jointed rail where sections of rail are bolted together about every 40 feet.

Figure 5: Examples of the Effects of Adverse Weather on Railroad Track

Source: Union Pacific Railroad.

Example of excessive heat forcing the rails out of alignment

Source: Union Pacific Railroad.

Example of excessive cold breaking a rail in half

FRA Also Faces Several Emerging Challenges to its Oversight of Rail Safety

Increases in Rail Freight Volume

FRA faces an emerging challenge in dealing with expected increases in freight rail traffic. FRA has estimated that the amount of freight shipped in the United States would increase by 1.1 billion tons (about 9 percent) across all modes from 2010 to 2020, with about 176 million tons of the increased amount shipped by rail.[35] According to the Association of American Railroads, this includes the rapid increase in freight rail traffic related to energy production, both in the transport of materials such as sand for use in hydraulic fracturing and the shipment of crude oil from oil fields. For example, crude oil shipments by rail increased from 9,500 carloads in 2009 to almost 234,000 carloads in 2012. These oil fields have rapidly developed in different areas across the country (such as North Dakota, west Texas, eastern Ohio, and western Pennsylvania). As

[35]This assumes that the share of freight shipped by each mode remains constant over this time period.

the recent accident at Lac Mégantic, Quebec, has shown, movement of hazardous materials, such as petroleum products, also involves the potential for severe accidents. Increases in freight rail volumes and shipment patterns, including the possible impact of the Panama Canal's widening in 2014, could result in shifts in railroad operations, which would increase the need for FRA safety personnel in locations where they may not currently be positioned.[36] However, as previously discussed, FRA's staffing process may not be flexible enough to respond quickly to such shifts. For example, FRA's tools for allocating its inspector resources rely on past accident data and inspection points. Although the data and models are updated periodically, it can take some time for the models' results (i.e., the inspection and staff allocation targets) to reflect new railroad infrastructure or shifting freight traffic. In addition, as previously discussed, FRA headquarters and regional officials stated it can take between 4 to 6 months and up to 4 years to get new inspectors hired, trained, and qualified to conduct inspections on their own.

In response to the rapid increase in rail traffic due to increased energy production, FRA headquarters officials have made a few temporary adjustments to respond to changes in traffic flows in some areas. For example, FRA responded to changes resulting from the development of the oil fields in North Dakota, where FRA did not have many inspectors, by reallocating an inspector position from inside the region, now assigned to Montana and North Dakota due to a recent vacancy. FRA regional officials said that it can be challenging to hire qualified inspectors for these affected areas or permanently relocate qualified inspectors there, but they do not see a need to reallocate any additional resources at this time.

Positive Train Control (PTC)

PTC is a significant technological change for the railroads and represents a groundbreaking new technology, unlike other aspects of railroad technology and operations. As we have previously reported, PTC is a communications-based system designed to prevent certain types of rail accidents caused by human factors, such as train-to-train collisions.[37]

[36]However, according to a recent United States Army Corps of Engineers report, while the widening of the Panama Canal will double the Canal's capacity, it is uncertain how that new capacity will drive intermodal freight logistics and infrastructure investment in the United States. Institute for Water Resources, United States Army Corps of Engineers, *U.S. Port and Inland Waterways Modernization: Preparing for Post-Panamax Vessels* (Washington, D.C., June 20, 2012).

[37]GAO-13-720.

PTC technology can automatically slow or stop a train that is not being operated safely due to some types of operator errors or a switch left in the wrong position. Further, PTC implementation is a complex and costly endeavor that touches almost every part of major rail lines and almost every aspect of their train operations. According to FRA, railroads required to implement PTC must do so on over 60,000 miles of track nationwide. In addition, FRA has reported that railroads must design, produce, and install more than 20 major PTC components, such as data radios for locomotive communication, locomotive management computers, and back office servers as part of the PTC implementation.[38] When deployed, PTC systems will include hardware and software applications inside locomotives, stationary wayside detection devices and in centralized control facilities that will cut across the silos of FRA's traditional rail safety disciplines.[39] Given the recent development of PTC, according to both FRA and railroad officials, there is not a large pool of expertise either inside or outside of FRA with extensive background in the operation of PTC systems.

FRA officials want to hire additional staff to oversee the certification and testing of PTC systems and believe that they will need more specialists in PTC to do so.[40] While FRA has determined that these specialists will be a new discipline that will fall outside of FRA's traditional compliance-based inspection rail safety oversight framework, FRA has not yet determined how many PTC specialists it will need or how they will be trained to oversee the new technology. FRA officials stated that they are looking to expand the agency's typical hiring pool to find specialists with the required expertise to oversee how PTC systems will be developed, tested, and maintained. However, FRA officials also stated that to date,

[38]GAO-13-720.

[39]RSIA mandated the implementation of positive train control (PTC) systems by December 31, 2015, on mainlines used to transport inter-city rail passengers, commuters, or any amount of certain toxic materials. Pub. L. No. 110-432, § 104. We found that most railroads that are required to have PTC in place reported that they will not meet this deadline. We reported that Congress should consider amending RSIA to grant FRA the authority to extend the PTC deadline on a case-by-case basis, to grant provisional certification of PTC systems before final system completion and to approve the use of alternative safety technologies in lieu of PTC. GAO-13-720.

[40]Currently, FRA has 10 PTC specialists, 3 other staff, and 1 supervisor who are responsible for reviewing and approving PTC system certification for the 37 railroads that will eventually be required to have operational, integrated PTC systems.

they have had little success competing with railroads and railroad suppliers to hire specialists.

Inspector Recruitment and Certification

FRA is currently facing some difficulty in recruiting, training, and certifying qualified inspectors in a timely manner. FRA's need to find an inspector for a certain discipline in specific geographic regions and to hire new PTC and safety risk reduction specialists can have an effect on FRA's ability to have certified inspectors where they are most needed. FRA regional administrators told us they were dissatisfied with the hiring process, which they perceive as slow and cumbersome and which can lengthen the time required to get a new inspector qualified to begin inspections. The speed of the hiring process is important since FRA officials estimate that 150 inspectors (about 30 percent of the current field safety workforce) will be eligible to retire over the next 5 years. FRA also competes with the railroad industry to hire qualified inspector candidates for their existing disciplines as well as PTC and safety risk reduction specialists. FRA headquarters officials stated that they were confident that they could recruit replacements and that not all inspectors may retire immediately when they are eligible. FRA headquarters officials stated that they have also hired some PTC and comprehensive rail safety risk reduction specialists; however, as these areas are new to FRA and FRA's oversight framework for them has not yet been fully implemented, FRA officials did not know how many more PTC or safety risk reduction specialists they will need to hire for these areas.

Inspector and Specialist Training

In addition to recruiting and certifying their inspectors and specialists, FRA must determine how to keep its growing and highly specialized workforce trained. Implementation of PTC will require extensive training of the FRA specialists responsible for its oversight, both initially as it is being developed and over time as the system is tested, implemented, and improved. Safety risk reduction specialists may also need ongoing training to keep up with new developments or standards in their field. FRA headquarters officials stated that they do not have a formal training plan that addresses the training needs for FRA's anticipated new rail safety oversight responsibilities, such as PTC or safety risk reduction plans. In addition, FRA regional administrators also expressed concern about both continuing "refresher" training and training for their current inspectors regarding new technologies, especially for PTC. Officials from six of the Class I railroads we spoke with said that FRA is slow to adapt to advances in railroad safety technology. For example, one Class I railroad safety official stated that FRA's inspectors largely inspected specific devices using visual observations in a straightforward, pass or fail inspection process. However, new technologies such as PTC are not as

straightforward to inspect because PTC consists mainly of software, not physical components. Several FRA regional administrators and inspectors we spoke with stated that their access to training opportunities has been reduced in recent years due to budget constraints and that the lack of training opportunities has affected their ability to learn about and familiarize themselves with new safety technologies.

Comprehensive Safety Risk Reduction Plans

As stated above, certain railroads were mandated by RSIA to develop comprehensive safety risk reduction plans. According to FRA officials, this new approach to improving railroad safety will require FRA and the railroads to identify systemic safety issues as well as understand specific technical problems. The safety risk reduction plans will include a comprehensive process for the application of criteria and techniques to optimize safety that should help railroads to manage risk, and develop proactive hazard management methods that would improve safety.

According to FRA officials, once guidelines for risk reduction plans are developed, the railroads will draft the plans and submit them to FRA for approval. FRA officials stated that instead of using compliance-based inspections to ensure that railroads are following any FRA rules and regulations regarding risk reduction plans, FRA specialists will lead a team of FRA inspectors and specialists to audit a railroad's compliance against its own plan. In addition, the officials noted that because comprehensive system safety is a new approach to safety, FRA's current inspector workforce does not have the skill set to conduct comprehensive audits. Although FRA has started hiring some new specialists who are trained in risk reduction to complete these audits, the agency has not determined how many railroads will be required to develop risk reduction plans, how audits of the plans will be conducted, or how the results of the audits will be used. FRA officials noted that the agency cannot make many of these determinations until the final rulemaking is completed.

FRA's Rail Safety Strategy Lacks a Strategic Human Capital Plan to Meet Rail-Safety Oversight Challenges

While FRA officials told us that they have addressed their hiring needs through their existing process and have been able to hire some PTC and safety risk reduction specialists, the agency has no formal plans to strategically address its human capital challenges. RSIA required FRA to create a long-term strategy setting out goals to improve railroad safety along with an annual plan that would include, among other things, estimates of the staff resources and training needs that are necessary to

achieve those goals.[41] Pursuant to this requirement, FRA has created a long-term safety strategy and included an annual plan in its annual budget request to Congress.[42] While FRA's safety strategy includes rail safety goals such as reduced accident rates from 2014 through 2018, it does not include estimates of staff resources or training needed to achieve the safety goals for those years.[43] The fiscal year 2014 version of the strategy states that the resources needed to meet the goals in the strategy are contained in the fiscal year 2014 budget request. However, the budget request does not include an estimate of resources or training needed beyond fiscal year 2014, critical years in which FRA will have to incorporate PTC and risk reduction plans into its current rail safety framework. In addition, as mentioned above, all of FRA's regional administrators told us that they see limitations in the process that FRA uses to determine staffing allocations and that FRA's current staffing model may not be flexible enough to provide the appropriate inspection needs in their regions. FRA officials stated that they are addressing their human capital needs through multiple avenues including rotational programs, knowledge transfers between departing and new employees, annual training opportunities, and monitoring staffing levels for mission-critical occupations for their annual budget requests. However, these efforts are not coordinated and integrated into a multi-year strategic human capital plan.

Moreover, FRA officials stated that while they have estimated projections for how many inspectors they may need for the next fiscal year, due to uncertainty around their annual budget, and how PTC and safety risk reduction plans will be implemented, they do not have a formal process to determine staffing needs and reassess their human capital needs year by year. In addition, FRA officials do not know how they will integrate new rail safety approaches, such as implementing risk reduction plans and PTC, into their current rail safety oversight framework.

[41]Pub. L. No. 110-432, div. A, § 102.

[42]U.S. DOT, FRA, *Railroad Safety Strategy: FY2014 (*Washington, D.C.: January 2013) and *Railroad Safety Strategy, FY2013-2017: Progress Assessment* (Washington, D.C.: January 2013).

[43]These rates include: highway-rail grade crossing incidents, human factor-caused train accidents, track-caused train accidents, equipment-caused train accidents, other (signal and miscellaneous) train accidents, and rail non-accidental hazardous materials releases. In addition, FRA has a performance measure, the overall rail accidents/incidents per million train miles, as part of the U.S. DOT Safety Performance Goals.

We have reported that federal agencies need to determine the occupations, skills, and competencies critical to achieving their missions and goals, as well as to identify any gaps between their current workforce and the workforce they will need in the future. In addition, strategic human capital management is on our High Risk List.[44] We have found that widespread lack of attention to strategic human capital management in the past has created a fundamental weakness in the federal government's ability to perform its missions economically, efficiently, and effectively. To address this issue, we have determined that successful strategic human capital plans should:

1. involve top management, employees, and other stakeholders in developing, communicating, and implementing the strategic workforce plan;
2. determine the critical skills and competencies that will be needed to achieve current and future programmatic results;
3. develop strategies that are tailored to address gaps in number, deployment, and alignment of human capital approaches for enabling and sustaining the contributions of all critical skills and competencies;
4. build the capability needed to address administrative, educational, and other requirements important to support workforce strategies; and
5. monitor and evaluate the agency's progress toward its human capital goals and the contribution that human capital results have made toward achieving programmatic goals.

Without a comprehensive strategic human capital plan, FRA management may be unable to appropriately determine the number of inspectors and specialists FRA needs to meet the ongoing and future challenges to its rail safety oversight mission and achieve its strategic rail safety goals. Such a plan could also help FRA management identify industry trends, projected retirements, skill gaps, and training needs. Without a comprehensive strategic plan, FRA may also not have the ability to make well-informed decisions about how to best meet the challenges to its rail safety oversight mission now and in the future. FRA also risks not having enough inspectors with the right skill set in the right locations across the country to achieve rail safety goals. In addition, FRA may not have

[44]GAO-13-283.

enough specialists to oversee the rail industry's implementation of both PTC and railroad safety risk reduction plans.

Conclusions

FRA faces several current and evolving challenges to its rail-safety oversight mission. In addition to being a relatively small agency compared to the industry it oversees, recent legislation has expanded its responsibilities at the same time as federal budgets have been constrained. In particular, RSIA mandated that FRA implement a risk reduction program—an effort that incorporates a more comprehensive risk-based approach to safety and represents a significant procedural and cultural change for FRA and the railroad industry. FRA has slowly taken steps to implement the risk reduction program, but the agency missed the mandated October 2012 deadline requiring certain railroads to develop and implement risk reduction plans. While the agency expects to complete the regulations in 2015, FRA has not developed a detailed strategy to manage the oversight of this effort to avoid further delays in issuing the regulations and to ensure the timely evaluation and approval of the railroads' risk reduction plans when they are developed.

In addition, FRA must compete with the railroad industry for qualified inspectors to support the FRA's existing rail safety oversight framework as well as for new safety specialists to oversee railroads' implementation of their safety risk reduction plans and new PTC systems. While FRA has long-term rail safety goals, it does not have a corresponding human capital strategy that lays out: 1) the resources it needs to achieve those goals, 2) how it will meet its current limitations to its staffing process, 3) how to maintain the existing workforce in numbers or training, 4) how it will meet its new PTC requirements and safety risk reduction plan initiative, or 5) meet future changes in freight flows. The uncertainty FRA faces regarding its future budgets in light of these human capital challenges underscores the need for FRA to focus and plan how it will recruit, train, deploy and retain its workforce to meet these challenges.

Without a plan, FRA risks not having a skilled and trained workforce, deployed in the right technical domains, to meet present and future challenges to the FRA's rail-safety oversight framework, especially to oversee the railroad industry's implementation of positive train control and comprehensive rail safety risk reduction plans. Although a strategic human capital plan does not guarantee FRA the resources it may need to meet these challenges, it could help FRA better align its strategic rail-safety goals and objectives with its limited resources to meet these human capital challenges. In addition, such a plan would demonstrate to

internal and external stakeholders how FRA officials could proactively meet these challenges and define FRA's rationale for those decisions, providing greater assurance that FRA officials are prioritizing resources to mitigate the largest rail-safety oversight risks and better prevent rail accidents.

Recommendations for Executive Action

To help ensure that the Federal Railroad Administration timely and effectively implements oversight of railroad risk reduction programs, manages its limited resources, and accounts for the evolving rail safety environment, we recommend that the Secretary of Transportation direct the Administrator of the Federal Railroad Administration to:

(1) develop an implementation plan for oversight of risk reduction programs for passenger and freight railroads, including interim milestones for finalizing its rulemaking and milestones for the review and approval of the plans; and

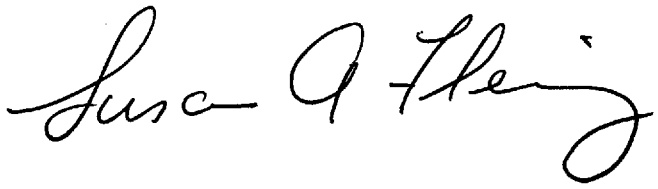
(2) develop a strategic human capital plan that identifies and prioritizes FRA's human capital needs and links them to FRA's strategic goals and objectives. This plan should include specific approaches for how FRA will recruit, train, and retain both its current inspectors as well as its new workforce of PTC and safety risk management specialists.

Agency Comments

We provided a draft of this report to the Department of Transportation for review and comment. In an email response, DOT reiterated its commitment to continuous rail safety improvement and stated that GAO's review of FRA's railroad safety oversight program had provided useful findings and recommendations for improving the program. DOT agreed to consider our recommendations and also provided technical comments that we incorporated as appropriate.

If you have any questions about this report, please contact me at (202) 512-2834 or flemings@gao.gov. Contact points for our Offices of

Congressional Relations and Public Affairs may be found on the last page of this report. Major contributors to this report are listed in appendix II.



Susan Fleming
Director, Physical Infrastructure Issues

Appendix I: Objectives, Scope, and Methodology

This report assesses the Federal Railroad Administration's (FRA) approach to railroad safety oversight as well as ongoing and emerging issues affecting rail safety oversight. We addressed the following objectives: 1) What is the overall framework that FRA, the states, and the railroads use to ensure safety of railroad operations and infrastructure? 2) To what extent do FRA and the railroads assess safety risks and allocate resources to address those risks? 3) What are the challenges to FRA's current safety framework, and what are the ongoing and emerging issues FRA faces in railroad safety oversight?

To address all objectives, we reviewed documentation from FRA including applicable laws and regulations. We interviewed FRA headquarters and region officials including administrators and specialists for each railroad safety discipline, and state rail safety officials as well as representatives from all Class I and selected Class II and III railroads, rail labor organizations, and representatives from selected industry stakeholders.[1] We also reviewed and analyzed reportable accident and incident data from 2003 through 2012 obtained from the FRA's Railroad Accident and Incident Reporting System (RAIRS) database. We conducted a data reliability assessment of the RAIRS database by interviewing knowledgeable agency officials, reviewing data and documents, and conducting electronic testing of the data. We determined that the data were complete, reasonable, and sufficiently reliable for the purposes of this report. These data were used to obtain current and historical descriptive statistics on train accidents across the nation and to make high-level comparisons about railroad safety across regions, classes of railroads, and primary causes of accidents, including accidents related to highway-rail grade crossings and weather.

To determine the overall railroad safety framework that FRA, the states, and the railroads use to ensure safety of railroad operations and infrastructure, we examined applicable laws and regulations including the Rail Safety Improvement Act (RSIA) of 2008, FRA guidance, and other documentation, including a recent Department of Transportation Inspector General report and prior GAO reports describing the oversight

[1]The Surface Transportation Board classifies freight railroads based on annual revenues. As of 2011 (the last year of data available), Class I freight railroads are those railroads that earn more than $433 million annually, Class II earn from about $35 million to $432 million annually, and Class III railroads earn less than about $35 million annually.

mechanisms that FRA uses to ensure railroad safety.[2] We conducted site visits to three of FRA's eight regions, including Atlanta, Georgia (Region 3), Chicago, Illinois (Region 4), and Fort Worth, Texas (Region 5). These regions together accounted for over 50 percent of all train accidents that occurred from 2003 through 2012. We selected these regions using criteria that included the number and mix of Class I, II and III railroads operating in the region, the highest number of reportable train accidents during the last 10 years in each region, including highway-rail grade crossing accidents as determined by our analyses of FRA accident data, and the extent to which the region had state safety inspectors. We also used FRA accident and incident data to identify the four FRA regions with the highest number of reportable train accidents for Class II and Class III railroads from 2003 through 2012. Within these four regions (Regions 1, 3, 4, 5), we selected a non-probability sample of 11 different Class II and Class III railroads to learn their perspectives about federal and state railroad-safety oversight including the extent of federal and state coordination and the frequency of inspections at their railroads. We interviewed eight FRA regional administrators and 15 FRA safety specialists, the FRA State Program Manager and five state railroad-safety program managers in California, Florida, Illinois, and Texas to understand their railroad safety framework and programs and the extent that FRA and state safety officials coordinate with each other to oversee railroad safety. We also interviewed operations and safety representatives from all seven Class I railroads, three Class II railroads, eight Class III railroads, and two railroad holding companies that own over 100 Class III railroads to understand their railroad safety framework and programs, including how railroads conduct their own inspections and oversight to ensure railroad safety. The results of the interviews in the selected FRA regions, states,

[2]GAO, *Rail Safety: The Federal Railroad Administration Is Taking Steps to Better Target Its Oversight, but Assessment of Results Is Needed to Determine Impact*, GAO-07-149 (Washington, D.C.: Jan. 26, 2007); Rail *Safety: The Federal Railroad Administration Is Better Targeting Its Oversight, but Needs to Assess the Impact of Its Efforts*, GAO-07-390T (Washington, D.C.: Jan. 30, 2007); *Rail Safety: The Federal Railroad Administration Is Better Targeting Safety Risks, but Needs to Assess Results to Determine the Impact of Its Efforts*, GAO-07-841T (Washington, D.C.: May 22, 2007); *Rail Safety: Preliminary Observations on Federal Rail Safety Oversight and Positive Train Control Implementation*, GAO-13-679T (Washington, D.C.: June 19, 2013). *DOT, Office of Inspector General Audit Report: FRA Is Nearing Completion of Rules Required by the Rail Safety Improvement Act, but Needs to Improve Oversight*, CR-2013-070 (Apr. 17, 2013).

and railroads are not generalizable to all the FRA regions, participating states,[3] or across all Class II and III railroads.

To determine the extent to which FRA and the railroads assess safety risks and allocate their resources to address those risks, we reviewed FRA documentation on the NIP process and the SAM model and interviewed FRA Office of Safety Analysis officials as well as all FRA regional administrators and FRA regional specialists in FRA Regions 3, 4 and 5. We used standard economic and statistical principles as criteria to assess the general reasonableness of the approach and assumptions used in FRA's Staff Allocation Model and its National Inspection Plan model. We reviewed FRA's approach for ensuring the reliability of the data used in the NIP process and SAM model. In addition, we interviewed all eight FRA regional administrators and FRA Regions 3, 4, and 5 safety specialists to discuss the usefulness of the NIP process and models and other tools that track inspector activity and allocate resources based on risk. We also obtained information on the status of FRA's implementation of its rulemaking regarding railroads' Risk Reduction Plans, as required by RSIA. We interviewed representatives from all seven Class I railroads about how they managed their safety risks, allocated inspection and other resources based on risk, and responded to changes in safety risks. We also interviewed officials at selected Class II and III railroads as well as rail labor organizations and other industry associations to understand their safety challenges and how they managed their risks.

To identify challenges in safety oversight and emerging safety issues that FRA and railroads face, we interviewed FRA headquarters officials about changes in safety risks and FRA's plans to respond to those changes. We interviewed all FRA regional administrators and FRA Region 3, 4, and 5 specialists for each rail safety discipline. We also interviewed state railroad safety program managers in California, Florida, Illinois, and Texas and representatives from all seven Class I railroads, selected Class II and III railroads, and seven rail labor organizations about emerging safety issues and challenges posed by adverse weather and

[3]As already mentioned, 30 of the 50 states and the District of Columbia (not including Puerto Rico and the U.S. territories) participate in the FRA's State Rail Safety Participation Program. States employ safety inspectors in the five rail safety inspection disciplines. State programs emphasize planned, routine compliance inspections; however, states may undertake additional investigative and surveillance activities consistent with overall program needs and individual state capabilities.

new railroad technologies. We also discussed with these groups ongoing issues related to highway-rail grade crossing safety. In addition, we observed railroad operating and safety practices, as well as railroad equipment and procedures used to ensure safety. Further, we were provided a tour of selected Class I and II training centers and the types of training provided to railroad employees, such as how simulators were being used to ensure safety. We also interviewed rail labor organization and railroad officials at selected Class II and III railroads to understand emerging safety risks and challenges at smaller railroads. Finally, we interviewed and obtained documentation from FRA headquarters officials on their initiatives to meet human capital requirements, such as hiring specialists and providing training to meet the emerging challenges and changes in the railroad industry.

We conducted this performance audit from December 2012 to November 2013 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Organizations Interviewed

We met with or contacted the following organizations in order to obtain a better understanding of railroad safety issues and obtain their perspectives on FRA's oversight approach.

Other federal agencies:

Federal Highway Administration (FHWA)

Freight railroads (Class I):

Burlington Northern Santa Fe Railway Company (BNSF)
Canadian National Railway (CN)
Canadian Pacific Railway (CP)
CSX Transportation, Inc. (CSX)
Kansas City Southern Railway (KCS)
Norfolk Southern Railway Company (NS)
Union Pacific Railroad Company (UP)

Passenger railroads:

National Railroad Passenger Corporation (Amtrak)
Northeast Illinois Regional Commuter Rail Corporation (Metra)

Regional and short line (Class II and Class III) railroads:	Brownsville & Rio Grande Railroad Chicago Terminal Railroad Finger Lakes Railway Florida East Coast Railway Fort Worth and Western Railroad Illinois Railway, LLC Indiana Rail Road Company Louisiana & Delta Railroad Pioneer Valley Railroad Providence and Worcester Railroad The Bloomer Line
Holding companies:	Genesee & Wyoming Inc. Iowa Pacific Holdings
Industry associations:	American Short Line and Regional Railroad Association Association of American Railroads Association of State Rail Safety Managers
Rail labor organizations:	American Train Dispatchers Association (ATDA) Brotherhood of Locomotive Engineers and Trainmen (BLET) Brotherhood of Maintenance of Way Employees Division of the International Brotherhood of Teamsters (BMWE) Brotherhood of Railroad Signalmen (BRS) International Association of Sheet Metal, Air, Rail and Transportation Workers (SMART) International Brotherhood of Electrical Workers (IBEW) Transportation Trades Department, AFL-CIO (TTD)
State oversight organizations:	California Public Utilities Commission Florida Department of Transportation Illinois Commerce Commission Texas Department of Transportation
Safety association:	Operation Lifesaver

Appendix II: GAO Contact and Staff Acknowledgments

GAO Contact

Susan Fleming, (202) 512-2834 or flemings@gao.gov

Staff Acknowledgments

In addition to the contact named above, other key contributors to this report were Susan Zimmerman (Assistant Director), Melissa Bodeau, Richard D. Brown, Aisha Cabrer, Robert Ciszewski, Tim Guinane, Greg Hanna, Rick Jorgenson, Sara Ann Moessbauer, Joshua Ormond, and Crystal Wesco.