

**ENHANCING THE FEDERAL RAILROAD
ADMINISTRATION'S OVERSIGHT OF TRACK
SAFETY INSPECTIONS**

Federal Railroad Administration

Report Number: CR-2009-038

Date Issued: February 24, 2009



Memorandum

**U.S. Department of
Transportation**

Office of the Secretary
of Transportation
Office of Inspector General

Subject: ACTION: Enhancing the Federal Railroad
Administration's Oversight of Track Safety
Inspections
Report No. CR-2009-038

Date: February 24, 2009

From: David Tornquist 
Assistant Inspector General
for Rail and Maritime Program Audits and
Economic Analysis

Reply to
Attn. of: JA-50

To: Acting Deputy Federal Railroad Administrator

This report presents the results of our audit of the Federal Railroad Administration's (FRA) oversight of track-related safety issues. The objective of this audit was to evaluate FRA's oversight of track safety on the Nation's freight rail lines. From 1998 through 2007, track defects were the second leading cause of train accidents, comprising 32 percent of the train accidents reported to FRA by the railroads.

We contacted officials from FRA, four Class I¹ railroads, one non-Class I railroad, the American Short Line and Regional Railroad Association, and the Brotherhood of Maintenance-of-Way Employees² regarding Federal track safety regulations, freight railroad inspection policies and procedures, and track safety issues. For the four Class I railroads visited, we analyzed data from a random sample of track inspection reports (conducted by the railroads' track inspectors from July through December 2007) to assess the frequency and type of inspection, the results of the inspection, and remedial actions taken. Exhibit A contains details on our audit scope and methodology. Exhibit B lists the activities we visited or contacted. We conducted this performance audit in accordance with generally accepted

¹ According to the Association of American Railroads' July 2008 statistics report, Class I freight railroad companies had minimum carrier operating revenues of \$346.8 million in 2006. Seven freight railroads qualified as Class I—Burlington Northern Santa Fe Railway Company, Canadian National Railway, Canadian Pacific Railway, CSX Transportation, Kansas City Southern Railway Company, Norfolk Southern Corporation, and Union Pacific Railroad Company.

² The Brotherhood of Maintenance-of-Way Employees is a division of the Rail Conference of the International Brotherhood of Teamsters, which represents and protects the rights of rail workers who build and maintain the track and structures on railroads throughout the United States.

Government Auditing Standards prescribed by the Comptroller General of the United States.

BACKGROUND

FRA is faced with the challenge of how best to enforce its rail safety regulations for about 567 railroads that haul various types of freight and 118 rail companies that transport passengers within the national railroad transportation system. From 1998 through 2007, the second leading cause of train accidents was track defects or problems related to rails and their roadbeds, according to reports the railroads submitted to FRA.³ During this time period, 10,069 of 31,403 train accidents, or 32 percent, were caused by track defects.⁴ These accidents can have long-term consequences, including injuries, deaths, and evacuations. For example, from 1998 through 2007, on average, 155 people were injured, 1 person was killed, and 1,310 people were evacuated each year, as a result of track-caused train accidents.

Safety on the Nation's freight rail lines is first and foremost the responsibility of individual railroads, which must comply with Federal safety regulations. Among other things, these regulations establish minimum safety requirements for railroad track, including how it is constructed, maintained, and inspected. To identify noncompliance with Federal rail safety regulations, FRA conducts periodic visual and automated inspections of the railroads' track and reviews the railroads' track inspection records. In addition, it issues regulations aimed at improving rail safety, investigates train accidents, analyzes data regarding train accidents and inspections conducted by its inspectors, responds to complaints, funds research for new technology, and sponsors training seminars for railroad employees on how to comply with Federal regulations.

RESULTS IN BRIEF

During this audit, we evaluated FRA's oversight of track safety on the Nation's freight rail lines. We found that FRA has taken steps to improve its track safety oversight program by expanding inspection activities and implementing new initiatives. FRA's oversight activities were conducting visual and automated inspections of the railroads' track to identify instances of noncompliance with its safety regulations. FRA also reviewed the railroads' track inspection records to assess compliance with Federal safety regulations. Since 2005, as part of its

³ The leading cause of train accidents was attributed to human factors, such as train crews improperly positioning switches and failing to secure a sufficient number of handbrakes. From 1998 through 2007, 11,116 of 31,403 train accidents, or 35 percent, were caused by human factors.

⁴ Over the same 10-year period, the rate of track-caused train accidents decreased from 1.32 per million train miles traveled to 1.15 per million train miles traveled, or 13 percent, as the number of train miles traveled increased.

National Rail Safety Action Plan—which targeted the most frequent, highest-risk causes of train accidents—FRA has implemented several initiatives to improve its oversight of track safety on the Nation’s rail lines. In April 2007, for example, FRA enhanced its Automated Track Inspection Program by adding two new geometry inspection vehicles, to expand its inspection capacity to nearly 100,000 track-miles per year.

We assessed whether FRA identified track defects that may affect safety and whether it took appropriate actions to enforce its track safety regulations. Our analysis of FRA’s track inspection data, reported from 2004 through 2007, found that its inspectors had conducted 62,529 inspections, identified 410,441 defects, and recommended 6,629 of these defects for violations. Moreover, our analysis of a random sample of the railroads’ track inspection reports found that the four Class I railroads we evaluated were visually inspecting their tracks as required by FRA’s safety regulations. However, we identified two areas where FRA can do more to enhance its oversight of the railroads’ track safety inspections.

Specifically, we found that:

- **FRA’s safety regulations for internal rail flaw testing did not require the railroads to report the specific track locations—milepost numbers or track miles—tested during these types of inspections.** Internal rail flaw testing (also known as ultrasonic⁵ and induction⁶ testing) is used to detect cracks and other weaknesses inside the rail that can not be found during visual track inspections. These internal rail flaws can lead to broken rail, which causes train accidents. From 2004 through 2007, 1,138 of the 4,103 (28 percent) track-caused train accidents reported by the railroads were attributed to broken rail. To address this safety problem, FRA’s regulations require the railroads to conduct ultrasonic or induction testing on their tracks—a continuous search for internal defects—to detect internal cracks and weaknesses inside their rails⁷ and document the date, location, and nature of internal rail defects and date and type of remedial actions taken.⁸

However, we found that FRA’s safety regulations do not require the railroads to report the specific track locations covered during internal rail flaw testing. FRA

⁵ Ultrasonic testing is designed to detect flaws in the rail head and web area.

⁶ Induction testing is designed to detect flaws only in the rail head.

⁷ 49 C.F.R., Part 213.237 specifies that this requirement is applicable to all railroads operating on track classified as Class 4 through Class 5, and Class 3 track with passenger train operations. The required frequency of testing for these classes of track is once every 40 million gross tons of traffic or once each year, whichever interval is shorter. For Class 3 track without passenger train operations, internal rail flaw testing should be conducted at least once every 30 million gross tons or once a year, whichever interval is longer.

⁸ 49 C.F.R., Part 213.241 requires that rail inspection records shall specify the date of inspection, the location and nature of any internal defects found, the remedial action taken and date thereof, and the location of any intervals of track not tested due to rail surface conditions.

track inspectors told us that without knowing the specific track locations that underwent internal rail flaw testing, they could not determine whether the railroads had conducted a continuous search for internal rail flaws. In February 2007 and again in September 2008, FRA tasked its Railroad Safety Advisory Committee (RSAC) to revise and strengthen the safety regulations for internal rail flaw testing. As of the date of this report, the work is still ongoing. *Because the success of FRA's oversight of internal rail flaw testing depends on the railroads' inspection results, including the specific track locations tested, FRA needs to include in its revision of its safety regulations a requirement that the railroads report all track locations (milepost numbers or track miles) tested during internal rail flaw testing.*

- **FRA's inspection data system does not provide adequate information for determining the extent to which FRA's track inspectors have reviewed the railroads' records for internal rail flaw testing and visual track inspections to assess compliance with safety regulations.** To identify track safety problems, FRA's track inspectors are required to review the railroads' records for internal rail flaw tests and visual track inspections. We analyzed the inspection data that FRA's track inspectors reported from 2004 through 2007 and found that the data did not indicate whether the records FRA reviewed related to internal rail flaw testing or visual track inspections. This reporting weakness was caused by the limited availability of activity codes in FRA's inspection data system, which did not allow FRA's track inspectors to separately report on their reviews of the railroads' records for internal rail flaw testing and visual track inspections. Instead, FRA's track inspectors reported the results of both of these reviews of railroads' inspection records under the same code in FRA's inspection data system.

FRA's track inspector's reviews are intended to determine that the railroads have complied with safety regulations for conducting internal rail flaw testing and visual track inspections, and identifying track safety problems. To address the reporting weakness, we recommended that FRA improve its track safety oversight by revising its Track Safety Compliance Manual and inspection data system, to include specific activity codes for FRA's track inspectors to report on the extent to which they assessed the railroads' compliance with safety regulations for conducting internal rail flaw testing and visual track inspections. In response to a draft of this report, FRA took prompt corrective actions and implemented this recommendation on February 11, 2009. A complete list of our recommendations and FRA's response begins on page 8.

FINDINGS

FRA Has Taken Steps To Improve Its Track Safety Program By Expanding Inspection Activities and Implementing New Initiatives, But It Can Do More To Enhance Its Oversight of Track Inspections

Since 2005, FRA has implemented several initiatives intended to improve its oversight of track safety on the Nation's rail lines. In May 2005, FRA launched its National Rail Safety Action Plan to target the most frequent, highest risk causes of train accidents. In March 2006, FRA implemented its National Inspection Plan—a strategic inspection resource allocation program that uses predictive indicators⁹ to assist FRA in conducting inspection and enforcement activities within a given geographic area or on a particular railroad. In April 2007, FRA enhanced its Automated Track Inspection Program by adding two new geometry inspection vehicles.¹⁰ This action expanded its inspection capacity to nearly 100,000 track-miles per year. Because these initiatives had not been fully implemented for a sufficient period of time before our audit, we could not assess their overall impact on track safety.

Routinely, FRA's 83 track inspectors oversee safety on the Nation's freight rail lines by: (1) conducting visual inspections and reviewing inspection records to determine whether the railroads have complied with FRA's regulations for conducting visual and ultrasonic or induction track inspections,¹¹ (2) identifying and reporting track defects, and (3) recommending violations to the Office of Chief Counsel, which can result in assessing fines and penalties against railroads. We analyzed FRA's track inspection data as reported from 2004 through 2007, and found that FRA's inspectors had conducted 62,529 inspections, identified 410,441 defects, and recommended 6,629 of those defects for violations. Moreover, our analysis of a random sample of the railroads' track inspection reports found that the four Class I railroads we evaluated were visually inspecting their tracks as required by FRA's safety regulations.

In addition to conducting visual track inspections, FRA's safety regulations require the railroads to conduct a continuous search for internal defects on their tracks using ultrasonic or induction testing equipment. This equipment detects internal cracks and weaknesses inside their rails that can not be found during visual track inspections. Figure 1 illustrates a common internal rail defect called a transverse fissure. A transverse fissure is a progressive fracture from the center of the rail head

⁹ FRA uses data on track miles, accidents/incidents, inspections, and defects as predictive indicators for planning track inspections.

¹⁰ A track geometry inspection vehicle measures various rail parameters, including the width between the rails (gage) and the distance one rail is above or below another (crosslevel), among other things.

¹¹ Track Safety Standards, Part 213.233 and Part 213.237, 49 C.F.R.

that spreads outward and is usually a round or oval spot within the rail head. Without the railroads conducting ultrasonic or induction testing on their tracks, such defects would not be detected and could ultimately lead to broken rail and increase the potential for train derailments. From 2004 through 2007, 1,138 of the 4,103 (28 percent) track-caused train accidents reported by the railroads were attributed to broken rail.

Figure 1: Internal Rail Defect in the Rail Head



Source: FRA

Although FRA has improved its Track Safety Program, it can do more to enhance its oversight of the railroads' tests for internal rail flaws. We found that FRA's safety regulations for internal rail flaw testing do not require the railroads to report the specific track locations—milepost numbers or track miles—tested during these types of inspections. In contrast, FRA's safety regulations require the railroads to report specific track locations on the results of their visual track inspections. Without knowing the milepost numbers or track miles tested, FRA track inspectors could not determine whether the railroads had conducted a continuous search for internal rail flaws.

Without information on the specific track locations tested, FRA can not assess the adequacy of the railroads' internal rail flaw testing programs. FRA was aware of this regulatory reporting problem and tasked its RSAC to address it, and other related safety issues, in February 2007 and again in September 2008. At the time of this report, the work was still ongoing. *Because the success of FRA's oversight of internal rail flaw testing depends on the railroads' inspection results, including the*

specific track locations tested, FRA needs to include in its revision of its safety regulations a requirement that the railroads report all track locations (milepost numbers or track miles) tested during internal rail flaw testing.

We also found that FRA's inspection data system does not provide adequate information for determining the extent to which FRA's track inspectors have reviewed the railroads' records for internal rail flaw testing and visual track inspections to assess compliance with safety regulations. To comply with FRA's regulations for internal rail flaw testing, the railroads use ultrasonic and induction rail testing equipment that is mounted under a hy-rail vehicle, as shown in figure 2.¹² To determine that the railroads are conducting the required internal rail flaw testing, FRA inspectors review the railroads' records for internal rail flaw testing and document their reviews in FRA's inspection data system.

Figure 2: Ultrasonic Internal Rail Flaw Testing Equipment Mounted to a Hy-Rail Vehicle



Source: FRA

We analyzed the inspection data that FRA's track inspectors reported from 2004 through 2007 and found that the data did not indicate whether the records FRA reviewed related to internal rail flaw testing or visual track inspections. This reporting weakness occurred because FRA's track inspectors documented the results

¹² Hy-rail vehicles are highway vehicles with retractable steel rail wheels that allow movements on a railroad track or a roadway.

of their reviews of internal rail flaw testing and visual track inspections records under the same inspection activity code in FRA's inspection data system, rather than under separate activity codes. Separate activity codes are essential for providing FRA's senior safety officials with key information to verify that their track inspectors properly performed the required record reviews. *The FRA should improve its track safety oversight by revising its Track Safety Compliance Manual and inspection data system to include specific activity codes for FRA's track inspectors to report on whether the record reviews the inspectors conducted were for internal rail flaw testing or visual track inspections. This change will allow FRA's senior safety officials to assess the extent to which inspectors determined that the railroads have complied with the relevant safety regulations.*

RECOMMENDATIONS

We recommend that FRA:

1. Revise its track safety regulations for internal rail flaw testing to require the railroads to report all track locations (milepost numbers or track miles) covered during internal rail flaw testing.
2. Revise its Track Safety Compliance Manual and inspection data system by including specific inspection activity codes for its track inspectors to report on whether the record reviews the inspectors conducted were for internal rail flaw testing or visual track inspections.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

We provided FRA a draft of this report on January 21, 2009. On February 5, 2009, FRA provided us with its formal comments (see appendix); and on February 10, 2009, it provided additional information during a teleconference to clarify its original comments and establish target completion dates. FRA concurred with our audit results and recommendations, and agreed to take corrective actions. We agree with the following FRA planned corrective actions.

Recommendation 1: FRA concurred with our recommendation to revise its track safety regulations to require the railroads to report all track locations covered during internal rail flaw testing. FRA's Office of Railroad Safety agreed that it is vital to require the railroads to maintain records to which FRA has access on demand during its oversight on the railroads' property. FRA plans to continue working with its Railroad Safety Advisory Committee's Rail Integrity Task Force to make changes to FRA's mandated reporting requirements and to address many areas of internal rail

flaw detection. FRA further stated that its time frame for changing the regulation is uncertain.

OIG Response: We consider FRA's proposed actions and planned completion date responsive to this recommendation. We agree that the ongoing work being conducted by the Rail Integrity Task Force to address many internal rail flaw detection issues is vital, particularly FRA-mandated reporting. FRA's February 5 formal comments did not provide a date for revising its safety regulations to require the railroads to report all track locations (milepost numbers or track miles) covered during internal rail flaw testing. However, on February 10, 2009, FRA senior track safety officials informed us that the target completion date for fully implementing our recommendation is December 2010.

Recommendation 2: FRA concurred with our recommendation to revise its Track Safety Compliance Manual and inspection data system by including specific inspection activity codes for its track inspectors to report on whether the record reviews they conducted were for internal rail flaw testing or visual track inspections. FRA agreed that including another inspection activity code for internal rail flaw testing would be helpful in tracking the number of rail inspection reports FRA inspects. On February 11, 2009, FRA issued a Technical Bulletin (Track-09-01) that established a new activity code for tracking the rail inspection reports reviewed by its track inspectors. FRA's bulletin also provided instructions to its track inspectors and specialists on how and when to use the new activity code. By February 2010, FRA plans to revise its Track Safety Compliance Manual to include this new activity code, among other things.

OIG Response: We consider the actions that FRA has taken responsive to this recommendation. FRA's new track inspection activity codes should significantly improve the Agency's ability to track its review of the railroads' internal rail flaw testing reports.

We consider FRA's actions taken and planned to be responsive to our recommendations. In accordance with Department of Transportation Order 8000.1C, we consider each recommendation resolved, but recommendation 1 will remain open pending the completion of FRA's planned actions. Further, we consider FRA's prompt actions to implement recommendation 2 appropriate and we have closed this recommendation.

We appreciate the courtesies and cooperation of FRA representatives during this audit. If you have any questions concerning this report, please call me at (202) 366-1981 or Brenda R. James, Program Director, at (202) 366-0202.

EXHIBIT A. OBJECTIVE, SCOPE, AND METHODOLOGY

The objective of this audit was to evaluate FRA's oversight of track safety on the Nation's freight rail lines. To determine whether FRA identifies track defects that may affect safety and takes appropriate actions to improve railroad operations, we reviewed Federal laws and regulations, FRA policies and procedures, and other relevant information to develop an understanding of Federal track safety inspection requirements. We contacted FRA officials in Washington, D.C., and four FRA regional offices located in Georgia, Pennsylvania, Missouri, and Texas. We visited four Class I railroads—Burlington Northern Santa Fe Railway Company (BNSF) in Fort Worth, Texas; CSX Transportation (CSX) in Jacksonville, Florida; Norfolk Southern Corporation (NS) in Atlanta, Georgia; and Union Pacific Railroad Company (UP) in Omaha, Nebraska. These four railroads experienced the highest number of track-caused accidents from 2005 through 2007. We also contacted representatives from one non-Class I railroad—Florida East Coast Railway—in Jacksonville, Florida; the American Short Line and Regional Railroad Association; and the Brotherhood of Maintenance-of-Way Employees in Washington, D.C.

To identify trends in track-caused train accidents, we obtained the railroads' train accident reports that were submitted to FRA from 1998 through 2007. We analyzed these reports to identify the number of track-caused train accidents reported each year. We also analyzed these track-caused train accidents by railroad. For the track-caused train accidents that FRA investigated from 2005 through 2007, we reviewed the investigation reports and compared them with the railroads' accident report to ensure the information the railroads had submitted agreed with FRA's investigation reports.

To assess FRA's track inspection procedures, we interviewed officials from FRA's Office of Safety Assurance and Compliance to obtain information on their roles and responsibilities for promoting rail safety and enforcing its track safety regulations. We obtained a detailed overview of FRA's National Inspection Plan and its impact on planning track inspections. We also accompanied FRA track inspectors in four regions on visual track inspections to determine how they conducted and documented these inspections. We analyzed FRA's track inspection records, from 2004 through 2007, to identify the number of track inspections conducted, number of defects identified, and number of defects recommended for violation.

To evaluate the railroads' compliance with track inspection regulations, we interviewed officials at four Class I railroads to obtain information on their track infrastructure and track inspection policies and procedures. During these site

visits, we requested a listing of mainline track segments owned by the four railroads. We worked with the OIG's senior statistician to generate a random sample of 71 railroad track segments owned by the four major Class I railroads. The milepost sample was selected from a 26-week inspection period of July through December 2007. We obtained and analyzed the visual track inspection reports identified in our random sample from each of the four Class I railroads to assess the railroads' compliance with Federal track safety standards, including required inspection frequency, method of inspection performed, results of the inspections and whether corrective actions were provided, and whether any required data were missing.

We conducted this performance audit from November 2007 through November 2008, in accordance with generally accepted Government Auditing Standards prescribed by the Comptroller General of the United States. 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 objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective.

EXHIBIT B. ACTIVITIES VISITED OR CONTACTED

Federal Railroad Administration

Office of the Associate Administrator for Safety, Washington, D.C.

Office of the Associate Administrator for Railroad Development, Washington, D.C.

Region 2, Philadelphia, Pennsylvania

Region 3, Atlanta, Georgia

Region 5, Fort Worth, Texas

Region 6, Kansas City, Missouri

Railroads

Burlington Northern Santa Fe Railway Company, Fort Worth, Texas

CSX Transportation, Jacksonville, Florida

Florida East Coast Railway, Jacksonville, Florida

Norfolk Southern Corporation, Atlanta, Georgia

Union Pacific Railroad Company, Omaha, Nebraska

Other

American Short Line and Regional Railroad Association, Washington, D.C.

Brotherhood of Maintenance-of-Way Employees, Washington, D.C.

EXHIBIT C. MAJOR CONTRIBUTORS TO THIS REPORT

<u>Name</u>	<u>Title</u>
Brenda R. James	Program Director
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APPENDIX. MANAGEMENT COMMENTS



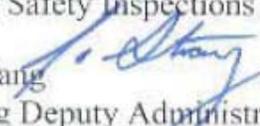
Memorandum

U.S. Department
of Transportation

Federal Railroad
Administration

Date: FEB 5 2009 Reply to Attn of:

Subject: **RESPONSE:** Draft Report on Enhancing the Federal Railroad Administration's Oversight of Track Safety Inspections

From: Jo Strang 
Acting Deputy Administrator

To: David Tornquist
Assistant Inspector General
for Rail and Maritime Program Audits and
Economic Analysis

This memo is in response to the draft report the Office of Inspector General (OIG) issued to the Federal Railroad Administration (FRA) on January 21, 2009, concerning the results of the OIG's audit of FRA's oversight of track-related safety issues.

1. OIG recommended that FRA revise its track safety regulations for internal rail flaw testing to require the railroads to report all track locations (milepost numbers or track miles) covered during internal rail flaw testing.

FRA's Railroad Safety Advisory Committee (RSAC) has an active Rail Integrity Task Force. FRA is deliberating with the National Transportation Safety Board, rail carriers, organized labor, and railroad contractors to determine the best way to address many areas of internal rail flaw detection. One of the areas the Task Force is looking into is the FRA-mandated reporting process. FRA's Office of Railroad Safety agrees that it is vital to require railroads to maintain records to which FRA has access on demand during our oversight on the property. That process should be added through the RSAC process. The RSAC process is ongoing and the timeframe for changing the regulation is uncertain.

2. OIG also recommended that FRA revise its Track Safety Compliance Manual and inspection data system by including specific inspection activity codes for its track inspectors to report on whether the record reviews the inspectors conducted were for internal rail flaw testing or visual track inspections.

Appendix. Management Comments

FRA agrees that including another inspection activity code for track inspections would be helpful in tracking the number of rail inspection reports FRA inspects. With the addition of the Rail Integrity Group within the Office of Railroad Safety, FRA has already added two more activity codes to be used specifically by that group. The Rail Integrity Group is now using codes for inspecting flaw detection processes and auditing inspection vehicles.

FRA expects to issue a new activity code for rail inspection records by February 19, 2009. The Office of Railroad Safety will then issue a memo to the track inspectors and specialists with instructions on how and when to use the code and when the compliance manual is revised later this year, after the Continuous Welded Rail regulation is finalized.

Thank you for the opportunity to respond to OIG's recommendations for FRA's oversight of track-related safety issues.