National Hazardous Materials Audit

Federal Railroad Administration
Office of Safety

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Executive Summary

The specific focus of the 2006 National Hazardous Materials Audit was to determine the level of Class I railroad compliance with the requirements for train placement of hazardous materials shipments and accurate hazard communications information on train consists in the train crews' possession. These regulations are specified in Title 49 Code of Federal Regulations (CFR) Sections 174.26(a) and (b). These activities were in direct support of the Federal Railroad Administration's strategic mission and the National Safety Program Plan.

The audit findings indicate that rail carriers need to improve compliance with Federal regulations pertaining to 49 CFR 174.26(a) and (b). The last audit of this magnitude was conducted in 2003, with a 7.4 percent defect ratio for train car placement of hazardous materials and a 6.5 percent defect ratio for communication of hazardous materials. By comparison, the 2006 audit reflects a considerably higher finding of hazardous materials regulatory noncompliance, with a 13.2 percent defect ratio for train car placement and 6.6 percent for communication. The overall individual defect ratios by railroad range from a low of 7.1 percent to a high of 30.4 percent. Significant change will be required in order to stem this level of noncompliance and ensure that train crews, emergency responders, and the general public have the protection they need.

Project Overview

Background
Federal Railroad Administration (FRA) Hazardous Material (HM) inspectors and railroad train and engine service employees have expressed concern that inaccurate crew notification of the position-in-train of railcars containing hazardous materials continues to be a recurring problem. This audit was designed to determine the level of regulatory compliance regarding train crew documentation by Class I carriers during hours when railroad supervision is not normally available or is at reduced levels. The audit was conducted at various locations nationwide and included all Class I carriers. The last hazardous materials audit of this magnitude to determine the accuracy of train consists across the rail transportation system was conducted in October 2003 by FRA HM inspectors and State participants. The 2003 audit was primarily conducted in daylight hours and reflected a consistent defect rate of 7.4 percent for car placement across the Nation's Class I railroads.

FRA's plan for a nationwide hazardous materials audit addressed FRA headquarters and FRA regional safety issues and concerns, as well as those raised by train and engine service employees, pertaining to the railroads' noncompliance with the train placement and consist requirements of the Hazardous Materials Regulations (Title 49 Code of Federal Regulations (CFR) Sections 174.26(a) and (b)).

Regulatory Requirements
Two basic requirements are outlined within the Federal regulations for ensuring that train crews have accurate information about the hazardous materials being transported in trains. Both regulations are located in 49 CFR 174.26. Paragraph (a) of this section requires that:

> The train crew must have a document that reflects the current position in the train of each rail car containing a hazardous material. The train crew must update the document to indicate changes in the placement of a rail car within the train. For example, the train crew may update the document by handwriting on it or by appending or attaching another document to it.

In addition, paragraph (b) in the section requires that:

> A member of the crew of a train transporting a hazardous material must have a copy of a document for the hazardous material being transported showing the information required by part 172 of this subchapter.

These two requirements make up the crux of hazard communication requirements that carriers are responsible for regarding rail transportation of hazardous materials. Hazard communication, including accurate location and contents for HM railcars, is essential in the event of an emergency so that response personnel can make informed response and public protection decisions. Absent this information, responders have historically taken a "stand-off" approach, potentially delaying the actions necessary to protect the public and the environment.

Scope and Objectives
The objective of the project was to monitor Class I railroads for overall compliance with Federal hazardous materials regulations as they pertain to train movements. The project scope included focused inspections of train consists by FRA HM inspectors and State participants, using a standardized reporting format for consistency, at various locations across all Class I railroads.

The project objectives were to identify problems pertaining to:

- Miscounting when adding or setting off cars.
- "No-bill" cars placed in a train.
- Placarded shipments not identified as hazardous materials.
- Onboard work order authority systems.
- Initial train lists being inaccurate by having additional or fewer cars than on the list.
- Failure of the train crew to update the train list, causing additional placement problems.
- Classifying cars into the wrong track in the classification yard and not updating their locations before pulling the track and setting it over in the departure yard.
- Receiving cars at an industry or interchange with unlisted hazardous materials cars.

Time and Duration
The audit schedule was designed to specifically evaluate compliance during second and third shifts during weekdays and on weekends. This schedule was selected because historical data indicate the majority of train traffic operates during these time periods.

The focused inspections of train consists was conducted over a 3-month period in order to maximize resource utilization and provide a broad overview of railroad operations. The audit was conducted from July 1 to September 30, 2006.

Project Staffing
The project team was comprised of four senior leaders and eight regional team contacts. The project sponsor was the Deputy Associate Administrator for Program Implementation, who ensured that the necessary resources were made available and provided senior leadership to the project. A project management professional (PMP) with experience in designing and running national programs was assigned to provide a systemwide approach. FRA's Railroad Safety Oversight Manager for CSX, a certified project manager, oversaw all aspects of the project from a programmatic standpoint. FRA's staff director of the Hazardous Materials Division, served as the project technical representative to address regulatory issues and provide data analysis efforts from a systems-based approach. The team leader provided daily oversight of the project. The team leader also served as a central point of contact with the regions and provided uniformity in program delivery. In addition, the team leader facilitated communication on the project and the setting of milestones and project goals.
Each region designated a "team contact" to serve as a liaison between the region and the team leader. The role of the regional team contact was to communicate, coordinate, and advise the

team leader on the progress of the inspections. The regional team contact duties were handled by HM supervisory specialists or, in several cases, assigned to inspectors. Each of the team contacts worked with regional HM inspectors during the project to monitor the consistency of inspections and proper completion of audit worksheets, and to review the preparation of inspection reports for accuracy. The team contacts also communicated with the team leader regarding any procedural matters that arose during the audit. The team leader consulted with the technical representative regarding regulatory matters. Conference calls were used by the team leader as a primary means of communication between the team contacts and FRA management to ensure timely information flow to all parties during the project.

Resource Allocation

It was determined that the Regions would be responsible for scheduling with inspectors to ensure project goals and objectives were accomplished within the prescribed milestones. Due to the nature of this project, two-person teams were recommended for efficiency and safety of the inspectors. The recommendation was made that each region should assign at least two inspectors to the audit. Regions were encouraged to use more than that number if they determined resources were available. To establish a baseline, each region was given a goal of 150 train inspections to be completed over the audit period.

Regions were instructed to utilize as many inspector teams as regional requirements permitted. Understanding that each region has a great number of yards in which crews go on and off duty for both local and through service, change crews, and build and dispatch trains, FRA determined that attempting to cover all yards would be impractical. Therefore, it was recommended that the largest classification yards and major interchange points in each region should be selected. A list of inspection locations was provided by each region for use in determining major Class I classification yards, terminals, and interchange points that would be used as inspection locations.

Communications Plan

Inspectors completed one audit worksheet for every train inspected. This worksheet was used to collect the data needed for the project and provided a consistent reporting format. A blank worksheet was distributed at the beginning of the audit and discussed during conference calls throughout the audit. Inspectors were instructed to provide worksheets to the team contact at the close of each inspection day. Team contacts collected all worksheets and sent hard copies to the team leader by the 15th of each month for the previous month (i.e., August 15th for the month of July).

Special coding for the Railroad Inspection Information System – PC (RISPC), FRA's inspection data collection program, was established to support data retrieval for the project audit. Instructions for use of the special codes were provided to all inspectors to ensure consistency of reporting within the RISPC system so that data could be separated from normal inspection activities, facilitating data analysis.

It was determined by the project management team that the project would not change the discretion afforded inspectors to determine appropriate enforcement actions. Rather, FRA's focus was to gain uniform reporting of findings that would enable the agency to address noncompliance on a systemwide and nationwide basis with the Class I rail carriers. In keeping

with current policy, if a determination was made for recommendation of civil penalty, the inspectors were to ensure that violations were fully sustainable and that all refutable issues that rail carriers might raise (e.g. updates or revisions to the consist) were addressed in the violation report. Additionally, inspectors were instructed that when a violation was recommended, it was to be noted on the worksheet following the Form FRA F6180.96 inspection report number. Inspectors were also instructed to follow regional guidelines and contact the project manager and team leader immediately if they determined that an "individual liability" would be recommended during the audit.

Throughout the audit, conference calls were scheduled as needed, based on issues that arose regarding obstacles hindering inspections. HM specialists and inspectors were instructed to document any other safety issues or concerns not addressed during the audit in an issues log. The issues log will receive followup by each region as part of regularly scheduled inspection activities.

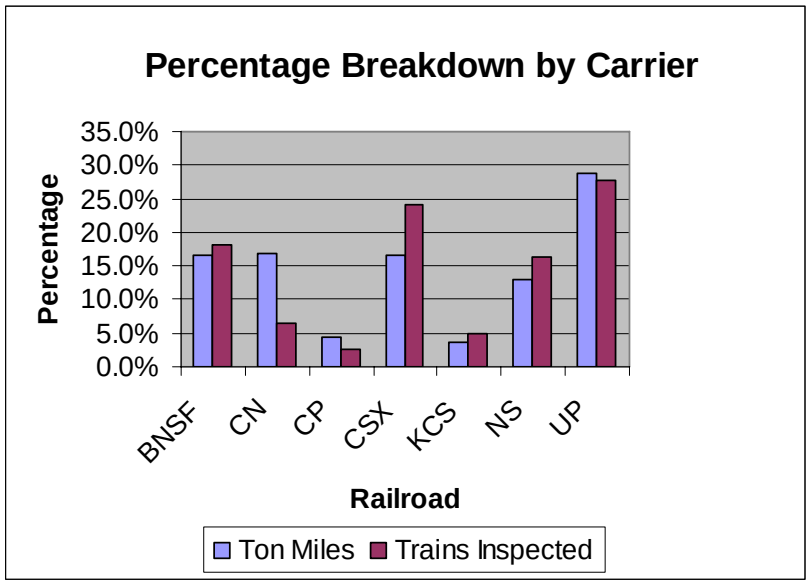
The project manager provided status reports to the sponsor, regional administrators, and project team during the 3-month audit. The information collected during the project was analyzed from a nationwide viewpoint as well as by individual carrier. The results are provided in the sections that follow.

Results Overview

General Analysis

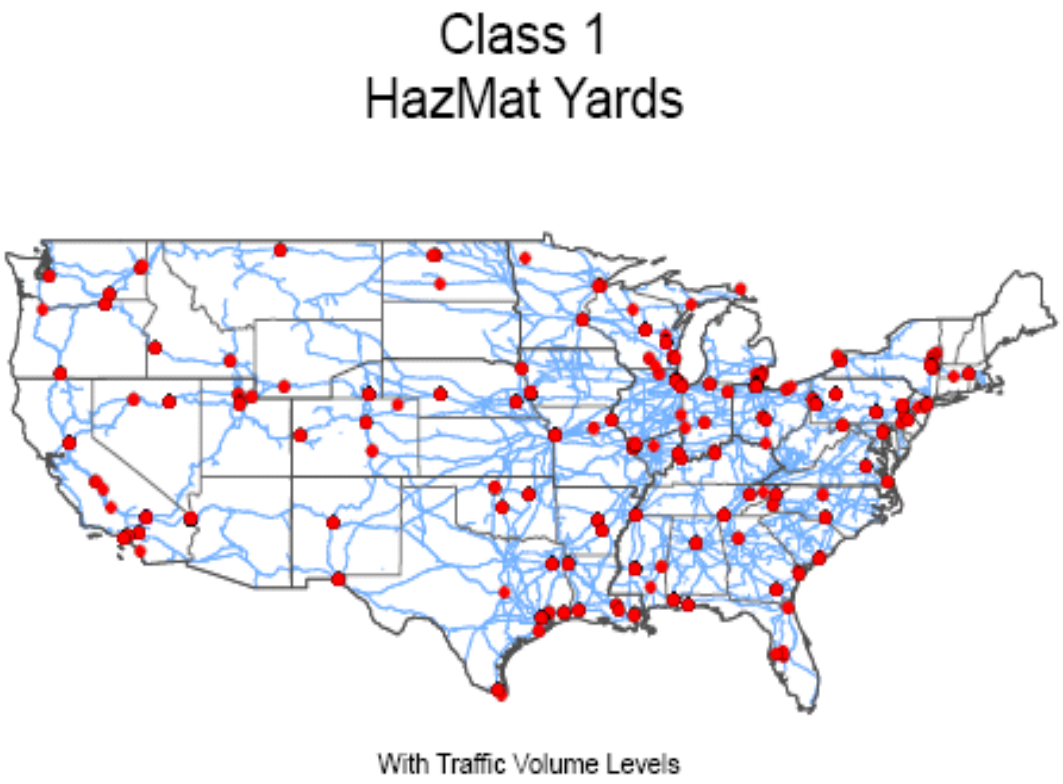
The data collected revealed that a total of 1,166 trains operated by Class I railroads were inspected for compliance during the audit period. The train inspections varied by rail carrier with the largest number of train inspections (324) conducted on the Union Pacific Railroad Company and the lowest number (29) performed on the Canadian Pacific Railroad. To determine if appropriate nationwide coverage was provided, the number of inspections performed per carrier was evaluated against the 2003 waybill sample analysis. As can be seen in Chart 1, the inspection percentages very closely mirror the originating tonnages of the rail carriers. Historically, waybill sample data has been used to estimate commodity and density flow patterns for HM transportation nationwide. There is a high degree of confidence in the accuracy of the 2003 waybill analysis and it is generally assumed that the tonnage percentages do not vary substantially from year to year.

Chart 1: Inspections vs. Tons Originated



An evaluation was performed to determine if the project experienced an adequate coverage of classification yards, terminals, and interchange points. This review, as demonstrated in Figure 1, revealed appropriate coverage throughout the national Class I railroad network. Figure 1 provides a graphic display of the inspection points, accompanied by rail routes highlighted according to hazardous materials tonnage quantities.

Figure 1: Project Inspection Points



In keeping with the project objectives, the majority of inspections, 86 percent, were performed during weekends and evenings. The normal workweek, Monday through Friday from 8:30 a.m. local time until 5:00 p.m. local time, was used as a division point for determining coverage. Night inspections were defined as inspections conducted Monday through Thursday from 5:00 p.m. local time until 8:30 a.m. local time. Weekend inspections were defined as inspections conducted between 5:00 p.m. local time Friday and 8:30 a.m. local time Monday. No inspections were conducted on the two Federal holidays that occurred during the project.

The terms "day," "night," and "weekend" are defined as follows:

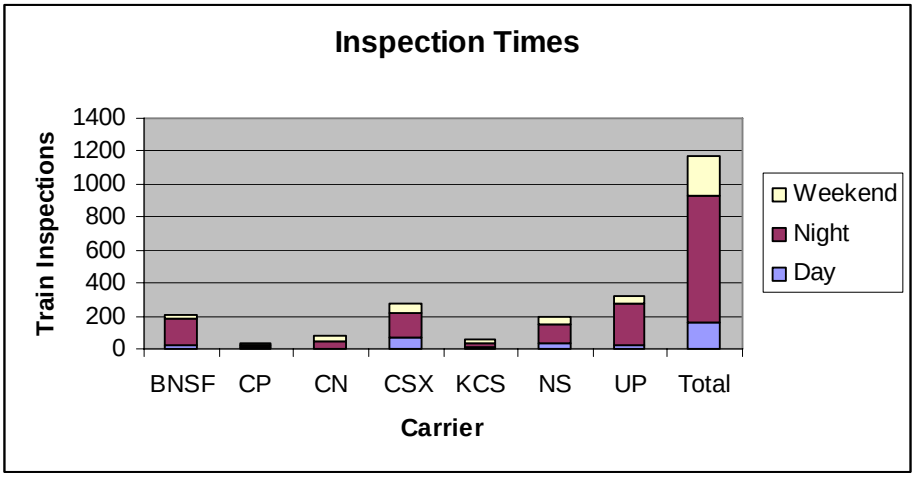
Day	Monday to Friday, 8:30 a.m. to 5:00 p.m. (local time)
Night	Monday to Thursday, 5:00 p.m. to 8:30 a.m. (local time)
Weekend	Friday, 5:00 p.m. to Monday, 8:30 a.m. (local time)

The table below provides an overview of the time inspections were performed at each of the Class I carriers and the corresponding defect ratios. Note the defect ratio for weekend is higher than the defect ratios for the other periods.

	Day	Night	Weekend	Total
Inspections	163	761	242	1166
% of Total	13.98%	65.27%	20.75%	
Defects	25	91	49	165
% of Insp. w/Defects (Defect Ratio)	15.34%	11.96%	20.25%	
% of Total	15.15%	55.15%	29.70%	

Chart 2, below, provides an overview of the time inspections were performed at each of the Class I carriers.

Chart 2: Time of Inspection



Objective Achievement
All regions except three were successful in meeting their goal of 150 trains inspected during the project timeframe. However, the inability to meet this goal had little impact on the overall results of the project and is indicative of the present workload of inspector resources. In general, the 1,166 reports provided a good overall view of the Class I railroad system's level of compliance with Federal requirements.

The project successfully met the overall objective of the program: the determination of a level of compliance for consist accuracy within the Class I railroad system. However, three of the initial project objectives were not met by the project and resulting data collection. These objectives included a determination of problems pertaining to onboard work authority systems, misclassification of cars in railroad yards, and the receipt of undocumented hazardous materials shipments at industry or interchange locations. Future activities may be geared toward providing information on these issues, depending on perceived problems in these areas.

Statistical Overview

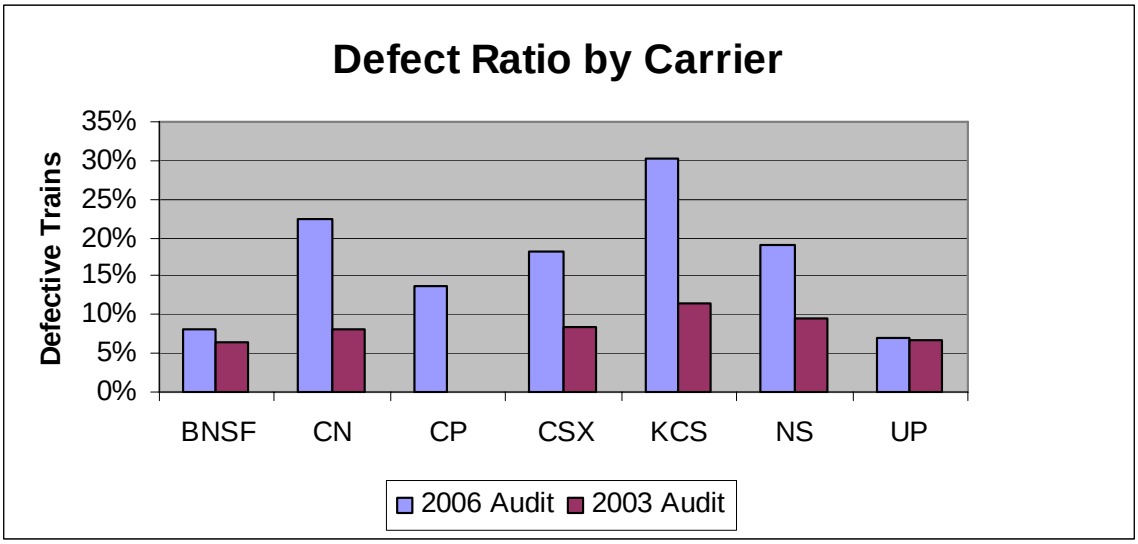
The audit worksheets and Form FRA F 6180.96 inspection reports were received by the team leader in accordance with the PMP and reviewed for accuracy. The worksheets provided a consistent reporting format, enabling the collection of data across all regions. Details of the data, overall and by individual carrier, are provided below.

Comparison with the 2003 Standing Order Project

The audit findings indicate that rail carriers are moving in the wrong direction with compliance of Federal regulations pertaining to 49 CFR 174.26(a) and (b). The last audit of this magnitude was conducted in 2003, with an overall 7.4 percent defect ratio for car placement. In comparison, the 2006 audit reflects a considerably higher finding of overall hazardous materials regulatory noncompliance, with a 13.2 percent defect ratio for 174.26(a). The findings also indicate that transportation during evening and weekend hours, when supervision is reduced or nonexistent, poses significantly higher potential for noncompliance from a general perspective.

Chart 3, below, provides a graphic representation of the percentage of trains inspected with defects on a carrier-specific basis. It compares the results of the current audit with those of the 2003 project, illustrating the negative trend in compliance. With little exception, all of the Class I carriers had higher defect ratios in the current audit. Only one carrier (Canadian Pacific Railway) had no identified problems during the 2003 audit, with only nine Canadian Pacific Railway trains inspected in the 2003 audit.

Chart 3: Defect Percentages by Carrier



When looking at the two audits, it is important to compare and contrast the two efforts in order to bring into perspective the final number of trains inspected and defects identified. The first point of comparison between the two projects is the time frame in which the inspections were conducted. The 2003 project was of 1-month duration, conducted during October 2003. The current audit was conducted over a 3-month period. The next point of comparison that the 2003 project focused on pertained to actual hazardous materials documentation noncompliance and actual car placement in-train noncompliance, whereas the 2006 project focused solely on the provisions of 49 CFR 174.26(a) and (b).

The 2003 project produced a total of 863 trains inspected. There were 64 defects taken for train placement (7.4 percent) across all Class I railroads. The 2003 defects with train placement are directly comparable to the 2006 audit's defect ratio of 13.2 percent for all Class I railroads. Comparison of the 2003 and 2006 defect ratios by carrier is provided in Table 1 below.

Table 1: Comparison of 2003 and 2006 Defect Ratios

Class I Carrier	2003 Defect Ratio	2006 Defect Ratio
Burlington Northern Santa Fe	6.5%	8.1%
Canadian National Railway	8.3%	22.4%
Canadian Pacific Railroad	0%	13.8%
CSX Transportation Inc.	8.5%	18.2%
Kansas City Southern	11.5%	30.4%
Norfolk Southern Corporation	9.5%	18.9%
Union Pacific Railroad Company	6.8%	7.1%

2006 Summary Statistics

The analysis of the worksheets from the eight FRA regions found that a total of 1,166 inspections were completed and that 165 defects indicated noncompliant trains. This represents an overall 14.2 percent defect ratio for consist accuracy (both 174.26(a) and (b) defects). In addition, nine additional trains were identified with defects not associated with the project but in noncompliance with other Federal regulations. These defects included such things as improper placement of cars within the train or hazard communication marking and placarding.

During the review, one key statistic stood out as an indicator that a systemic problem may exist. The review indicated that 28 of the noncompliant trains were the result of the train crew's failure to update their information. This single problem accounted for 16.9 percent of all noncompliant trains, with the possible exception of the Norfolk Southern Corporation, where the data indicate compliance with these requirements. However, the project identified crew responsibility as a potential for a system-based improvement.

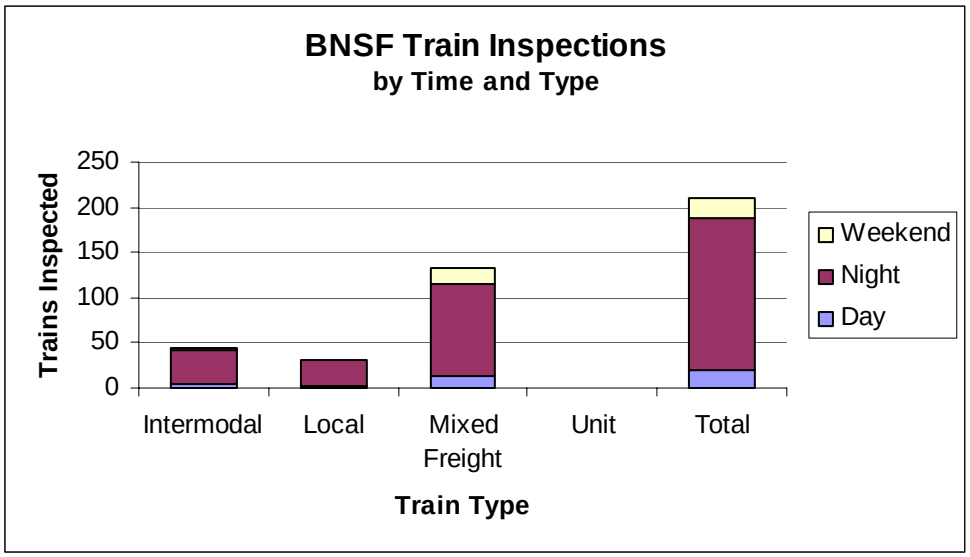
In looking at the data for train placement noncompliance, 93 percent of the 165 trains with defects had a hazardous material car not in the position indicated by the consist documentation. Of the most concern are those trains with a hazardous material car that was out of position by more than one. Failure to accurately communicate the location of hazardous materials cars could result in unnecessary delay or confusion during an accident or incident. The audit identified that 30.3 percent of the defective trains had one or more cars that were out of position by more than one.

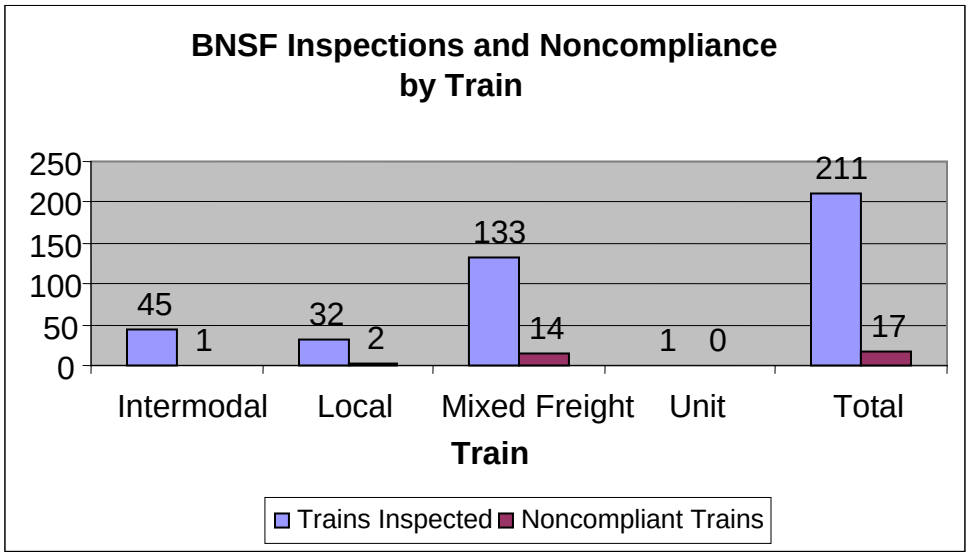
Another disturbing trend was the finding that 29 trains (17 percent of all noncompliant trains), including 7 that were not indicated on the reporting form but were indicated on the inspection report, were found with hazardous materials shipments within the train when the crew did not have any information for the shipments. The presence of undocumented and unknown hazardous materials shipments within a train is an especially dangerous situation, should an accident occur. Emergency responders rely on the information that train crews carry to safely identify the presence of hazardous materials and make decisions about response tactics. Without this information, responders cannot develop adequate plans that protect themselves and the communities they serve, which may result in unnecessary delays, injuries, or possibly deaths. By far, the presence of undocumented shipments of hazardous materials poses the greatest danger during transportation.

Individual Carrier Analysis

The carrier-specific analysis contains a breakdown of the findings for each railroad using charts, tables, and observations. The findings are designed to guide the reader in making overall determinations of major areas for potential improvement. Additional evaluations may be necessary for each specific road in order to identify location-specific problems. Future analysis may be conducted in order to gain a clear understanding of the nature of these localized issues.

Burlington Northern Santa Fe (BNSF)
The BNSF portion of the project entailed inspection of 211 trains with a total of 17 noncomplying trains identified. This equates to an 8.1 percent defect ratio.





	Day	Night	Weekend	Total
Inspections	20	168	23	211
% of Total	9.5%	79.6%	10.9%	
Defects	2	13	2	17
% of Insp. w/Defects	10.0%	7.7%	8.7%	
% of Total	11.8%	76.5%	11.8%	

Type	Direction	Inspected	% of Total	Defect	% of Group	% of Total
Intermodal	IN	33	15.6%	1	3.03%	0.47%
Intermodal	OUT	12	5.7%	0	0.00%	0.00%
Local	IN	8	3.8%	2	25.00%	0.95%
Local	OUT	25	11.8%	0	0.00%	0.00%
Mixed Freight	IN	61	28.9%	9	14.75%	4.27%
Mixed Freight	OUT	71	33.6%	5	7.04%	2.37%
Unit	IN	1	0.5%	0	0.00%	0.00%
Total		211		17	8.1%	

FRA inspectors did not observe any exceptions with hazardous materials car documentation, 49 CFR 172.202, 172.203 and 172.602. However, problems were noted with consist errors, §174.26(a). Specifically, train crews failed to update the train consist to reflect actual car placement as required.

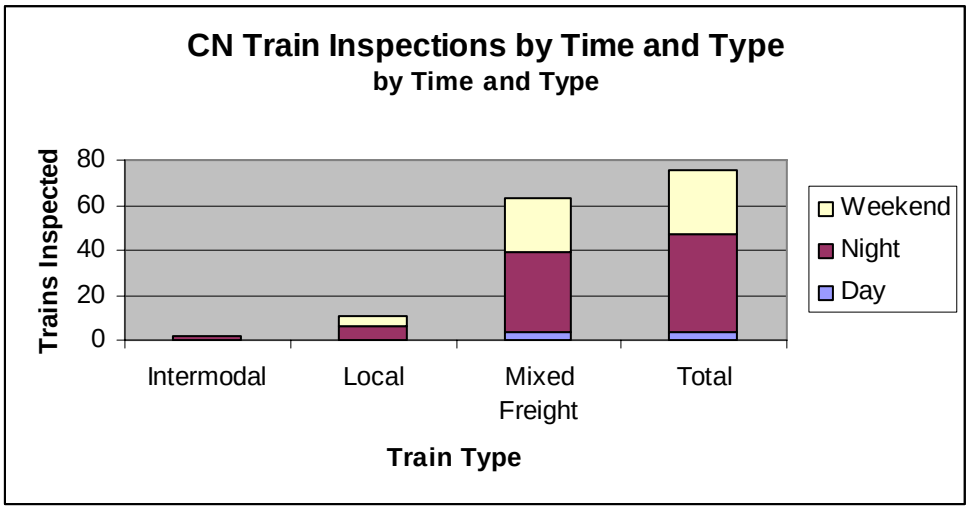
Train crew failure to update the train consist was observed in five inbound trains. For the purposes of this report, distinction was made for inbound trains that had consists, in which train crews changed the position and placement of cars en route to the point of inspection or prior to departure.

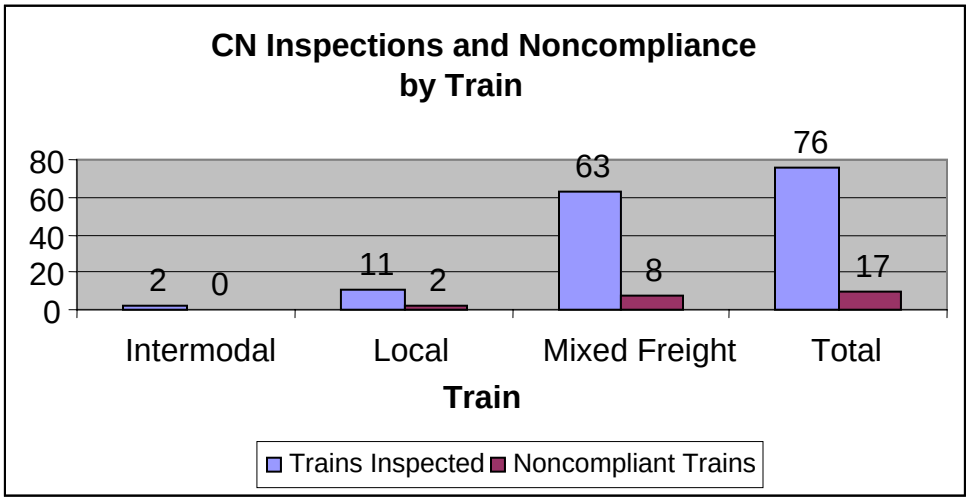
The survey indicates BNSF has a problem with yard inventory in varying severity as evidenced by the following:

- Four trains, three inbound and one outbound, had one car out of position by one.
- Two outbound trains had two or more cars out of position by one.
- Three trains, one inbound and two outbound, had six or more cars out of position by more than one.
- Three inbound trains had cars listed on the consist that were not actually in the train.

Canadian National Railways (CN)

The CN portion of the project entailed inspection of 76 trains with a total of 17 noncomplying trains identified. This equates to a 22.3 percent defect ratio.





	Day	Night	Weekend	Total
Inspections	4	43	29	76
% of Total	5.3%	56.6%	38.2%	
Defects	1	11	5	17
% of Insp. w/Defects	25.0%	25.6%	17.2%	
% of Total	5.9%	64.7%	29.4%	

Type	Direction	Inspected	% of Total	Defect	% of Group	% of Total
Intermodal	IN	1	1.3%	0	0.00%	0.00%
Intermodal	OUT	1	1.3%	0	0.00%	0.00%
Local	IN	5	6.6%	2	40.00%	2.63%
Local	OUT	6	7.9%	0	0.00%	0.00%
Mixed Freight	IN	33	43.4%	8	24.24%	10.53%
Mixed Freight	OUT	30	39.5%	7	23.33%	9.21%

FRA inspectors observed exceptions with hazardous materials car documentation, 49 CFR 172.202, 172.203 and 172.602. Problems were also noted with consist errors, § 174.26(a) and (b), including train crews failing to update the train consist to reflect actual car placement as required and trains dispatched with erroneous consist information.

Train crew failure to update the train consist was observed in six inbound trains and one outbound train. For the purposes of this report, distinction was made for inbound trains that had consists, in which train crews changed the position and placement of cars en route to the point of inspection or prior to departure.

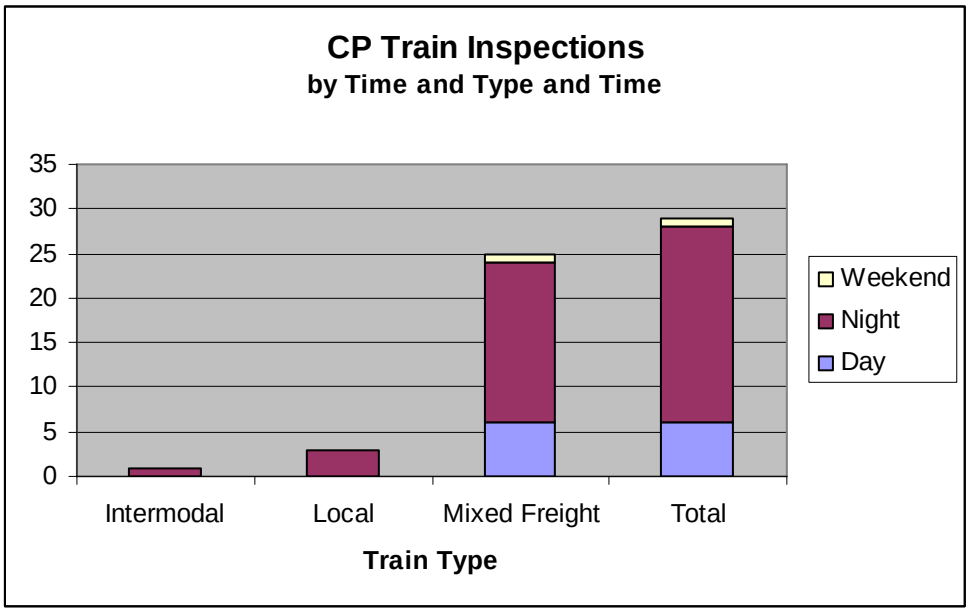
Of the 17 noncomplying trains, 2 trains each had 1 car with a total lack of hazardous materials documentation.

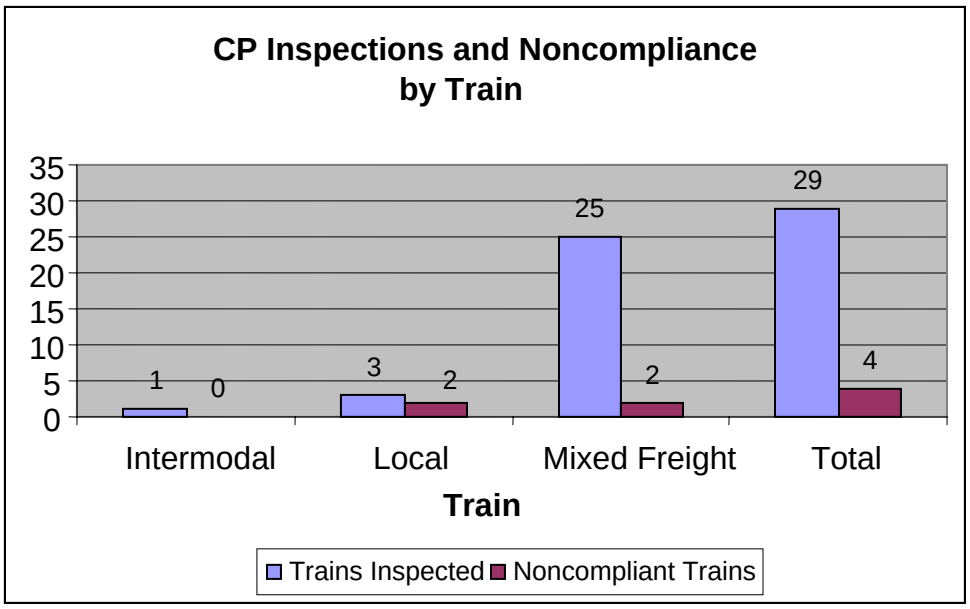
The survey indicates CN has a problem with yard inventory in varying severity as evidenced by the following:

- One inbound train had two or more cars out of position by one.
- Four trains, three outbound and one inbound, had one to five cars out of position by more than one.
- One outbound train had six or more cars out of position by more than one.
- One outbound train had a car listed on the train consist, but no car location noted on the consist.

Canadian Pacific Railroad (CP)

The CP portion of the project entailed inspection of 29 trains with a total of 4 noncomplying trains identified. This equates to a 13.8 percent defect ratio.





	Day	Night	Weekend	Total
Inspections	6	22	1	29
% of Total	20.7%	75.9%	3.4%	
Defects	2	2	0	4
% of Insp. w/Defects	33.3%	9.1%	0.0%	
% of Total	50.0%	50.0%	0.0%	

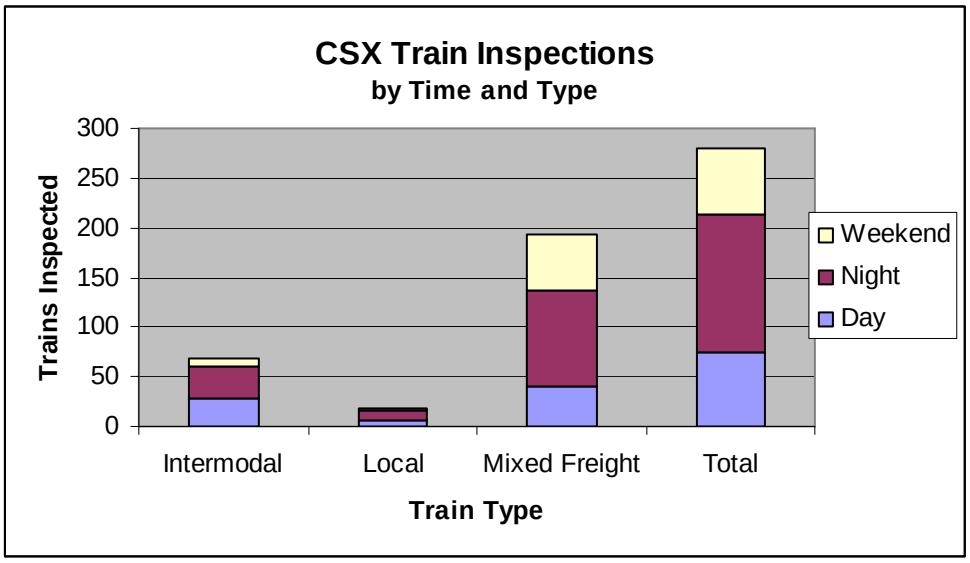
Type	Direction	Inspected	% of Total	Defect	% of Group	% of Total
Intermodal	IN	1	3.4%	0	0.00%	0.00%
Intermodal	OUT	0	0.0%	0	0.00%	0.00%
Local	IN	2	6.9%	2	100.00%	6.90%
Local	OUT	1	3.4%	0	0.00%	0.00%
Mixed Freight	IN	15	51.7%	2	13.33%	6.90%
Mixed Freight	OUT	10	34.5%	0	0.00%	0.00%
Total		29		4	13.8%	

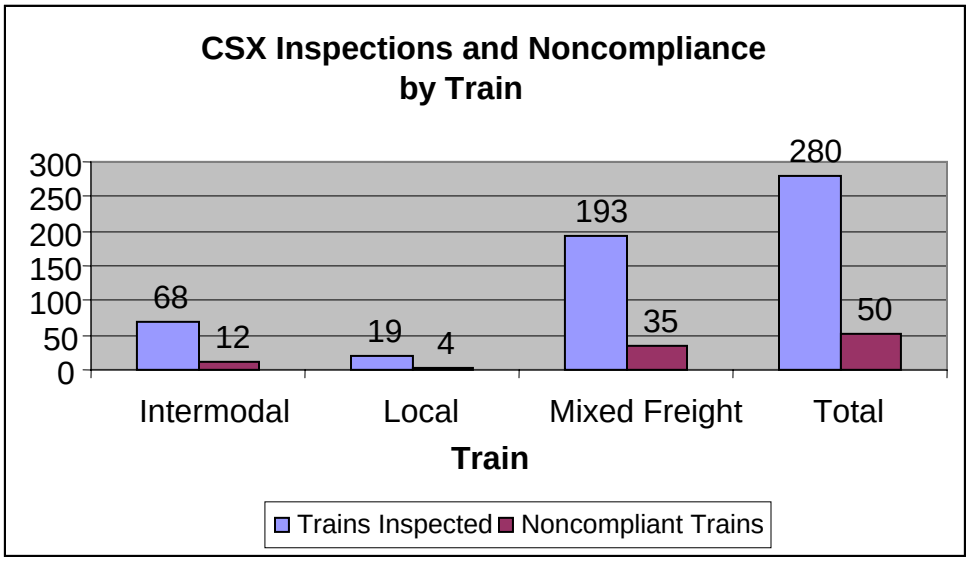
FRA inspectors did not observe any exceptions with hazardous materials car documentation, 49 CFR 172.202, 172.203 and 172.602. However, problems were noted with consist errors, § 174.26(a). Specifically, train crews failed to update the train consist to reflect actual car placement as required.

Train crew failure to update the train consist was observed in two inbound trains. For the purposes of this report, distinction was made for inbound trains that had consists, in which train crews changed the position and placement of cars en route to the point of inspection or prior to departure.

The survey indicates CP has a problem with yard inventory in varying severity as evidenced by two inbound trains having one to five cars out of position by more than one.

CSX Transportation, Inc. (CSX)
The CSX portion of the project entailed inspection of 280 trains with a total of 50 noncomplying trains identified. This equates to an 18.1 percent defect ratio.





	Day	Night	Weekend	Total
Inspections	75	138	67	280
% of Total	26.8%	49.3%	23.9%	
Defects	11	22	18	51
% of Insp. w/Defects	14.7%	15.9%	26.9%	
% of Total	21.6%	43.1%	35.3%	

Type	Direction	Inspected	% of Total	Defect	% of Group	% of Total
Intermodal	IN	48	17.1%	10	20.83%	3.57%
Intermodal	OUT	20	7.1%	2	10.00%	0.71%
Local	IN	8	2.9%	2	25.00%	0.71%
Local	OUT	11	3.9%	2	18.18%	0.71%
Mixed Freight	IN	88	31.4%	21	23.86%	7.50%
Mixed Freight	OUT	105	37.5%	14	13.33%	5.00%
Total		280		51	18.2%	

FRA inspectors observed exceptions with hazardous materials car documentation, 49 CFR 172.202, 172.203 and 172.602. Problems were also noted with consist errors, § 174.26(a) and (b), including train crews failing to update the train consist to reflect actual car placement as required and trains dispatched with erroneous consist information.

One inbound train had incorrect hazardous materials documentation for two to five cars.

Train crew failure to update the train consist was observed in 15 trains, 11 inbound and 4 outbound. For the purposes of this report, distinction was made for inbound trains that had consists, in which train crews changed the position and placement of cars en route to the point of inspection or prior to departure.

Of the 51 noncomplying trains, 9 trains contained cars with a total lack of hazardous materials documentation as follows:

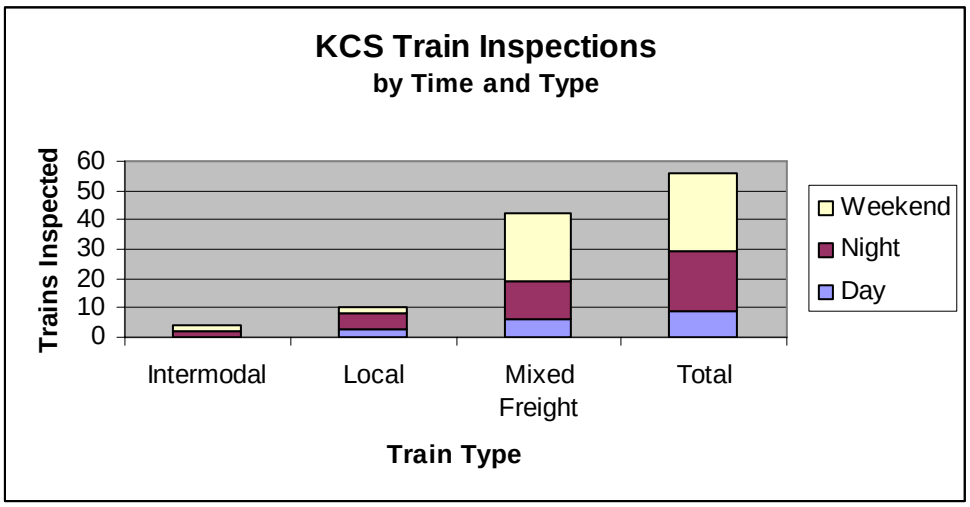
- Six trains, four inbound and two outbound, contained one car each with a total lack of hazardous materials documentation.
- One inbound train contained two to five undocumented cars.
- Two inbound trains contained six or more undocumented cars.

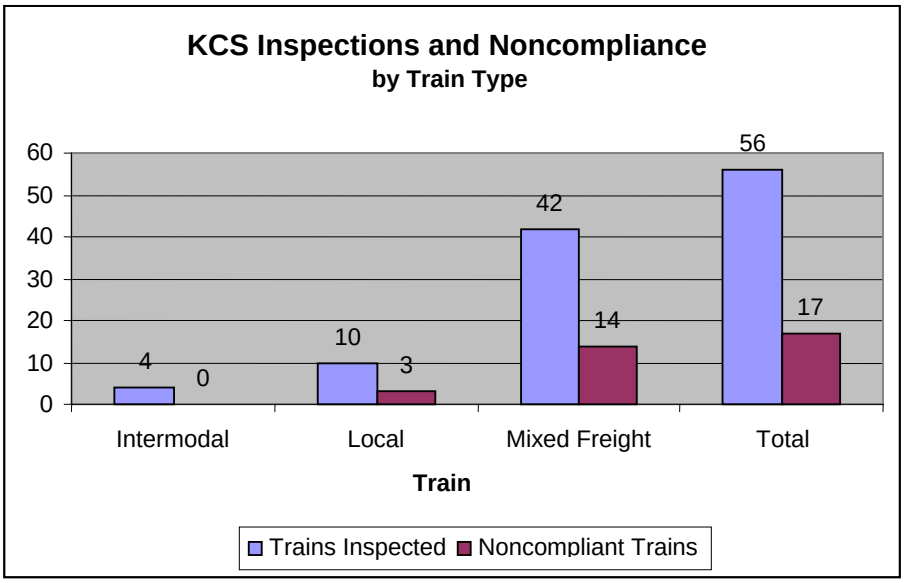
The survey indicates CSX has a problem with yard inventory in varying severity as evidenced by the following:

- Eleven trains, six inbound and five outbound, had one car out of position by one.
- Six trains, three inbound and three outbound, had two or more cars out of position by one.
- Six trains, five inbound and one outbound, had one to five cars out of position by more than one.
- Eight trains, five inbound bound and three outbound, had six or more cars out of position by more than one.
- Two trains, one inbound and one outbound, had cars listed on the consist but no car location noted on the consist.

Kansas City Southern (KCS)

The KCS portion of the project entailed inspection of 56 trains with a total of 17 noncomplying trains identified. This equates to a 30.4 percent defect ratio.





	Day	Night	Weekend	Total
Inspections	9	20	27	56
% of Total	16.1%	35.7%	48.2%	
Defects	2	6	9	17
% of Insp. w/Defects	22.2%	30.0%	33.3%	
% of Total	11.8%	35.3%	52.9%	

Type	Direction	Inspected	% of Total	Defect	% of Group	% of Total
Intermodal	IN	3	5.4%	0	0.00%	0.00%
Intermodal	OUT	1	1.8%	0	0.00%	0.00%
Local	IN	5	8.9%	1	20.00%	1.79%
Local	OUT	5	8.9%	2	40.00%	3.57%
Mixed Freight	IN	23	41.1%	7	30.43%	12.50%
Mixed Freight	OUT	19	33.9%	7	36.84%	12.50%
Total		56		17	30.4%	

FRA inspectors observed exceptions with hazardous materials car documentation, 49 CFR 172.202, 172.203 and 172.602. Problems were also noted with consist errors, 174.26(a) and (b), including train crews failing to update the train consist to reflect actual car placement as required and trains dispatched with erroneous consist information.

Two inbound trains had incorrect hazardous materials documentation for two to five cars.

Train crew failure to update the train consist was observed in four inbound trains.

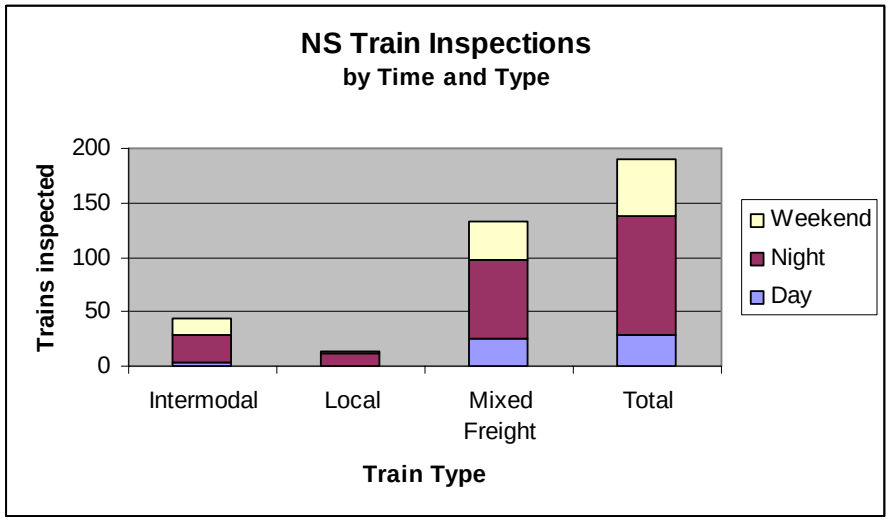
Of the 17 noncomplying trains, 3 trains contained cars with a total lack of hazardous materials documentation as follows:

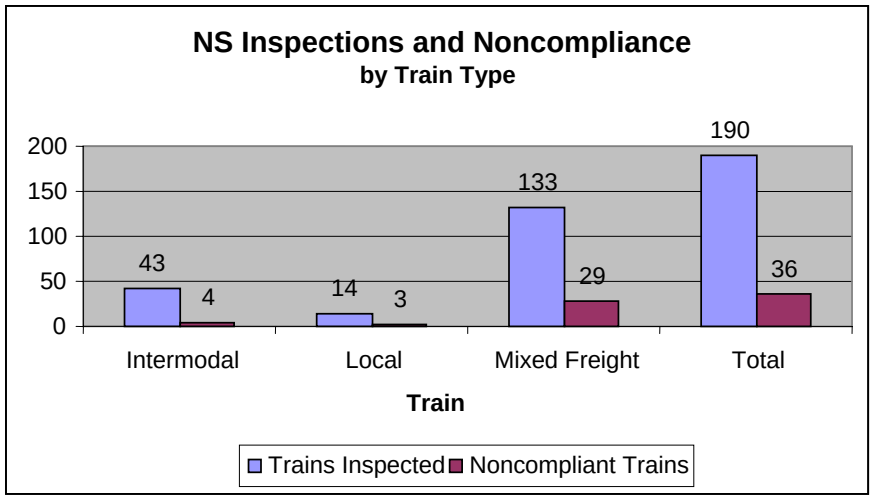
- One inbound train contained one car with a total lack of hazardous materials documentation.
- One inbound train contained two to five undocumented cars.
- One inbound train contained 20 undocumented cars.

The survey indicates KCS has a problem with yard inventory in varying severity as evidenced by the following:

- Two trains, one inbound and one outbound, had one car out of position by one.
- Four trains, two inbound and two outbound, had two or more cars out of position by one.
- One outbound train had one to five cars out of position by more than one.
- Three outbound trains had six or more cars out of position by more than one.

Norfolk Southern Corporation (NS)
The NS portion of the project entailed inspection of 190 trains with a total of 36 noncomplying trains identified. This equates to a 18.9 percent defect ratio.





	Day	Night	Weekend	Total
Inspections	29	109	52	190
% of Total	15.3%	57.4%	27.4%	
Defects	5	20	11	36
% of Insp. w/Defects	17.2%	18.3%	21.2%	
% of Total	13.9%	55.6%	30.6%	

Type	Direction	Inspected	% of Total	Defect	% of Group	% of Total
Intermodal	IN	28	14.7%	3	10.71%	1.58%
Intermodal	OUT	15	7.9%	1	6.67%	0.53%
Local	IN	12	6.3%	3	25.00%	1.58%
Local	OUT	2	1.1%	0	0.00%	0.00%
Mixed Freight	IN	76	40.0%	16	21.05%	8.42%
Mixed Freight	OUT	57	30.0%	13	22.81%	6.84%
Total		190		36	18.9%	

FRA inspectors observed exceptions with hazardous materials car documentation, 49 CFR 172.202, 172.203 and 172.602. Problems were also noted with consist errors, § 174.26(a) and (b), including instances where train crews for three separate trains failed to update the train consists to reflect actual car placement as required. However, although noncompliance was noted, this was not an issue of major concern as it only constituted a defect ratio of 1.6 percent.

Three inbound trains had incorrect hazardous materials documentation as follows:

- Two trains had incorrect hazardous materials documentation for one car.
- One train had incorrect hazardous materials documentation for six or more cars.

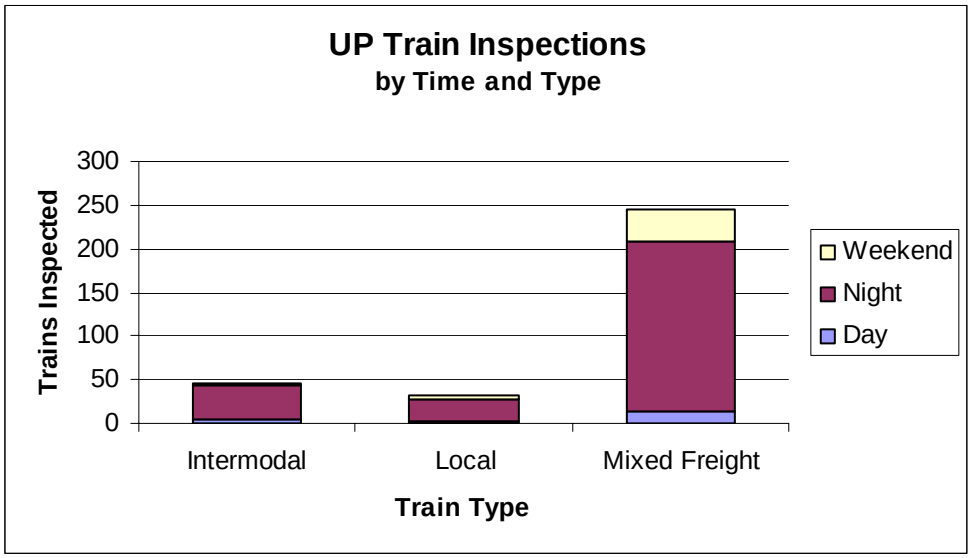
Of the 36 noncomplying trains, 5 trains contained cars with a total lack of hazardous materials documentation as follows:

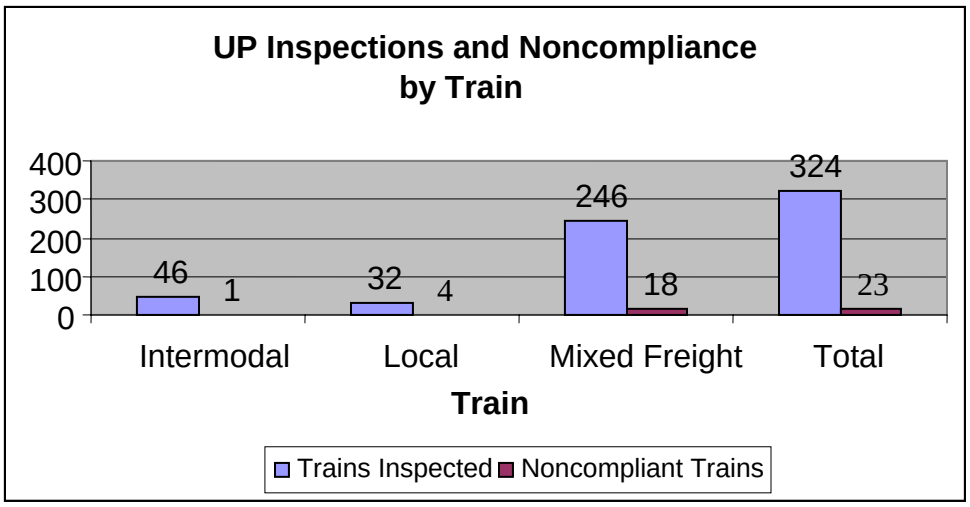
- Four trains, two inbound, one outbound and one unknown, contained one car with a total lack of hazardous materials documentation.
- One inbound train contained two to five undocumented cars.

The survey indicates NS has a problem with yard inventory in varying severity as evidenced by the following:

- Three trains, two inbound and one outbound, had one car out of position by one.
- Six trains, one inbound and five outbound, had two or more cars out of position by one.
- Nine trains, seven inbound and two outbound, had one to five cars out of position by more than one.
- Six trains, three inbound and three outbound, had six or more cars out of position by more than one.
- One outbound train had cars listed on the consist that were not actually in the train.
- One outbound train had a car listed on the consist but no car location noted on the consist.

Union Pacific Railroad Company (UP)
The UP portion of the project entailed inspection of 324 trains with a total of 23 noncomplying trains identified. This equates to a 7.1 percent defect ratio.





	Day	Night	Weekend	Total
Inspections	20	261	43	324
% of Total	6.2%	80.6%	13.3%	
Defects	2	17	4	23
% of Insp. w/Defects	10.0%	6.5%	9.3%	
% of Total	8.7%	73.9%	17.4%	

Type	Direction	Inspected	% of Total	Defect	% of Group	% of Total
Intermodal	IN	17	5.2%	1	5.88%	0.31%
Intermodal	OUT	29	9.0%		0.00%	0.00%
Local	IN	15	4.6%	4	26.67%	1.23%
Local	OUT	17	5.2%		0.00%	0.00%
Mixed Freight	IN	110	34.0%	10	9.09%	3.09%
Mixed Freight	OUT	136	42.0%	8	5.88%	2.47%
Total		324		23	7.1%	

FRA inspectors observed exceptions with hazardous materials car documentation, 49 CFR 172.202, 172.203 and 172.602. Problems were also noted with consist errors, § 174.26(a) and (b), including train crews failing to update the train consist to reflect actual car placement as required and trains dispatched with erroneous consist information.

One inbound train had incorrect hazardous materials documentation for one car.

Train crew failure to update the train consist was observed in seven trains, six inbound and one outbound. For the purposes of this report, distinction was made for inbound trains that had consists in which train crews changed the position and placement of cars en route to the point of inspection or prior to departure.

Of the 23 noncomplying trains, 3 trains contained cars with a total lack of hazardous materials documentation as follows:

- Two trains, one inbound and one outbound, contained one car with a total lack of hazardous materials documentation.
- One inbound train contained two to five undocumented cars.

The survey indicates UP has a problem with yard inventory in varying severity as evidenced by the following:

- Four trains, two inbound and two outbound, had one car out of position.
- One inbound train had two or more cars out of position by one.
- Four trains, three inbound and one outbound, had one to five cars out of position by more than one.
- Three inbound trains with six or more cars out of position by more than one.
- One outbound train had cars listed on the consist that were not actually in the train.
- One outbound train had a car listed on the consist but no car location noted on the consist.

Conclusions

The project demonstrated that the level of compliance with two regulations that are essential to proper response to hazardous materials incidents and accidents is at an unacceptable level throughout the Class I Railroad system. The causal factors for this vary by railroad and location. However, some basic changes would result in improvements over the general system. For example, increased awareness through training and accountability to railroad employees, including supervisory personnel responsible for train operations, would go far to address approximately 17 percent of the identified problems. Using a "best practices" approach may allow railroads to find methods for improvement not previously identified or considered.

Several questions that arose as a result of the data evaluation deserve additional exploration. The project design, as well as the data collected, was not sufficient to determine if the problems associated with train consist inaccuracies were the result of problems within the "electronic railroad" or the lack of yard personnel to manually ensure compliance. Computerized systems are a modern necessity to ensure economic operations; however, total reliance on systems with higher than acceptable rates of errors poses substantial problems, including noncompliance and additional costs. Further investigation on a road-by-road basis is required in order to understand the cause of many of the problems found during the project.

Recommendations

The following recommendations are made as a result of the findings.

To the Association of American Railroads:

- Within the allowances of Federal statutes and regulations, facilitate a best practices review of the Class I railroad industry to assist members in improving train consist accuracy. This review should be conducted within a 90-day timeframe following presentation of the findings of this report and should include a response to the FRA Associate Administrator for Safety concerning the actions taken by the AAR and member roads.

To the Class I Railroads:

- Take immediate actions to raise the compliance levels within the railroad system. These actions should be reported to FRA through the carrier's senior leadership.
- Conduct a detailed analysis of the findings to identify specific factors contributing to instances of noncompliance and incorporate changes that improve train consist accuracy. The findings of the detailed analysis should be provided to FRA within 90 days of receiving this report.
- Within the allowances of Federal statutes and regulations, work with the AAR to conduct a best practices review that highlights areas where practices and technologies can be shared to reduce the level of noncompliance nationwide.
- Work with the transportation trade unions and railroad employees to strengthen the awareness of individual employee responsibilities pertaining to the accuracy of train consists. These efforts should focus on additional training and awareness measures.

To the Transportation Trade Unions:

- Improve communications with train inspection and train, yard and engine (TY&E) personnel to ensure they are aware of their responsibilities to maintain accurate train consist information and provide proper information to departing train crews from terminals and other points of departure.
- Work with the rail carriers to improve employee training regarding the findings of this report.

Next Steps

The following next steps have been developed from this project. The goal is to effectively communicate the findings of the audit and to outline FRA's plan for followup to the audit.

During the Railroad Senior Management Meetings, or sooner, FRA will present the Class I carrier's senior managers with the audit findings. Included with the package will be the physical inspection reports for the instances in which trains were identified in a state of noncompliance. The presentation and associated information package will serve as a point of open discussion on the findings. The railroads will be provided an opportunity to present any actions taken since the audit. Because of the nature and gravity of the problems found, railroads will be advised that compliance is required immediately. No grace periods for attaining compliance will be provided.

FRA may, at any time, conduct unannounced followup hazardous material field inspections to determine if railroads are in compliance with the requirements identified in the project. If noncompliance is found on a specific railroad or railroads, FRA will take all actions necessary, including compliance agreements or compliance orders, to obtain improvements with each carrier.

Additionally, FRA will provide a similar presentation to the transportation trade unions advising them of their members' responsibilities in the safe transportation of hazardous materials. The unions will be advised that FRA will begin holding railroad train crews, and others who fail to perform their duties as required by regulation, accountable for their actions. This may include such enforcement tools as individual liability for crew members who fail to update information as required.

The Staff Director, Hazardous Materials Division, will be responsible for the direction of followup inspection activities with the regions and for coordinating any further enforcement action with the FRA Office of Chief Counsel.

FRA will package the 111 violations for carrier noncompliance with CFR 174.26 (a) and (b) Notice to Train Crew between July 1 and September 30, 2006, recorded during the national audit, for special handling outside of the normal claims collection process with FRA's Office of Chief Council.

FRA regional specialists will review the specific findings pertaining to their regions, identifying the particular areas over which they have control (e.g. some findings within the region are inherently transported from other regions), and develop a plan to address the specific railroad and key areas in which further efforts will produce maximum results. Headquarters personnel will assist as necessary in analysis and program delivery issues.

Future determinations that should be considered include whether a Phase II audit should be conducted to review training, onboard work order authority systems, employee attitude toward compliance, and carrier actions, to ensure compliance with Federal hazardous material regulations.